

Designing an Innovative Flat Floor Covering By Using Remains Yarns on Face to Face Carpet Machines for High Functional Performance to Multiple Purposes

Hend Ahmed Amen Abdallah

Spinning, weaving and knitting Department, Faculty of Applied Arts, Helwan University, Egypt.
hend_a.2007@yahoo.com

Abstract: This paper concerned with the production of flat floor coverings with innovative designs using the remnants of pile yarn in factories carpets and rugs, and this will be on the face-to-face carpet machines, quality of double shot, where mixing more than textile installation with each other to get this innovative design with the effects of colors by which can be used different degrees of one color from pile yarn without affecting on the quality of the design appearance, and this with higher functionality when used, this with higher functionality when used. In this research, has been producing a number of innovative designs for flat floor coverings, was then testing them to demonstrate their suitability for high functional performance to multiple purposes, Also conducted a questionnaire to indicate the acceptance of the different categories of consumers for this kind of floor coverings. All the steps and all test methods were explained and results were discussed to demonstrate the possibility of producing this kind of floor coverings, suitability for the functional performance and the acceptance of its consumer.

[Hend Ahmed Amen Abdallah. **Designing an Innovative Flat Floor Covering By Using Remains Yarns on Face to Face Carpet Machines for High Functional Performance to Multiple Purposes.** *J Am Sci* 2013;9(12s):99-115]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 12

Key words: flat floor coverings, face to face woven carpet, double shot machine carpet, carpet structures, pile yarn.

I. Introduction

Floor coverings whether carpets or wall to wall carpets is one of the important textile products, so the designer of this products must continuous thinking to develop these kinds of textile products, this by creating new designs in a scientific manner and a new executive specifications, in order to the products of floor coverings commensurate with multiple uses by high functional efficient, to help raise the their efficiency of competitiveness in different and multi markets to commensurate with most levels and all purposes with the increase in production and quality.

The different kinds of floor coverings used in multiple of areas and purposes, such as houses and businesses, offices, schools, hospitals, cinemas, theaters and tourist sites, including the coastal need a special specifications to the presence of a large quantity of sand, thereby requiring a product its surface does not contain pile (flat) with a high resistance to abrasion and soiling.

With the great technological and rapid development in machines of carpets and floor coverings by mechanical methods, Which led to the existence of machines of face-to-face carpet production, by which can produce two completely identical layers of pile carpets and floor coverings⁽¹⁾.

Production of quality flat floor coverings is one of the modern applied methods for the production of floor coverings that could be implemented on this type of machinery, where by this technique can produce two completely separate layers of flat floor coverings,

which can be completely alike and non-alike as the execution method we use.

There are several types of machines producing face to face carpets, and in this study we will use the machinery of the quality of double shot to produce samples of flat floor coverings with innovative designs and high functionality for multi-purpose which can be used in places that do not prefer the use of carpet with a pile such as places of coastal and cinemas and theaters.

In this type of machinery the basic way to produce carpets depend on weaving the two carpets facing each other, and weaving each of them completely independently, since each respective layer has a ground warp yarns and weft yarns of its own without the other layer, and cohesion between them caused by pile yarns that moving between them, and are separated from each other by a knife on a special bar moving reciprocating movement on the width of the loom in the distance between the two layers of carpet, ground warp consists of two sets of yarns: the first group is chain warp, and the second group is stuffing warp⁽²⁾.

To move the warp pile between the two carpets be done by Jacquard devices that have evolved in successive stages until the newly arrived to the electronic Jacquard, and whereby possible production floor coverings with innovative designs, this type of Jacquard is supplied by the face to face carpets machines used to produce samples under study, it is mainly in the production of designs for these samples^{(3),(4)}.

In this research has been producing samples of floor coverings can be used as carpets or wall to wall carpets, these samples with flat pile and innovative designs have been produced using leftover yarns, which is not suitable for the production of pile carpets due to the different degrees of color that affect the quality of the appearance of pile carpet.

So that the presence of exhaust from the remains of pile yarn in the factories for producing carpets and rugs is a big problem, this problem produces when using yarns with a specific color to produce some designs. Predominantly at the end of the production of these designs the amount of yarns exist, when used in the production of other designs, It is necessary adding a further quantity of the same color yarns, but in most cases these yarns additive differ from yarns available in the degree of color, and as a result the designs produced from these yarns be defective in color, especially the designs pile with large areas of color.

Therefore, in this research these yarns are used in the production of flat floor coverings, which would lead to the achievement of the following objectives:

- 1- Protect the environment from the accumulation of this residue of yarns and the consequent of providing its disposal costs.
- 2- Innovation products with functional values, high color effects, and aesthetic appearance.
- 3- Reduce the cost of production of floor covering carpets and rugs.

Key to the design of these samples is to control the movement of pile warp by Jacquard so do not move these yarns between the two carpets, but each color of pile warp moves within one carpet only that may be face or back, so depending on the textile composition for designs of carpets, which feeds the Jacquard relating to machine.

The main base for the implementation of these designs is customize the upper pile warp yarns on the creel to produce the top carpet and the lower pile warp yarns on the creel to produce the back carpet, where

this yarns interactive with the ground wefts according to the carpet structure to be implemented in the design.

As a result, textile structures produced was able to maintain the properties to be met by floor coverings through the interactive of pile warp yarns with ground wefts.

2- Design Principles and Methods:

2-1 Design principles and methods for pile carpets:

In the case of the production of pile carpets on face to face carpets machines, the two carpets product completely alike in textile installation and design^{(5),(6)(7)}.

Where the basic idea is dependent on the movement of pile warp yarns in the distance between the two carpets where they are separated by a knife moving with horizontal reciprocating movement on the bar is installed on the machine width.

Figure (1) illustrates one of the textile structures used to produce pile carpets, where the following notes:

Installation of the textile floor for each of the top carpet and back carpet is 1/1 + 2/2, where each carpet has its own stuffing warp and chain warp without the other, every carpet its own (1 stuffing warp + 2 chain warp).

Stuffing warp yarns joins with wefts by textile structure 1/1 with impregnating almost 0% for stuffing warps, chain warp yarns joins with wefts by textile structure 1/1(each one single yarn) and textile structure 2/2 (2 yarns together) with impregnating very high for chain warps.

Number of colors on the creel supplemented the machine are 8 colors arranged from bottom to top, colors No. 1, 2,3,4 on the creel dedicated to the back carpet, and colors NO. 5, 6, 7, 8 on the creel dedicated to the face carpet, this means that in case of non-appearance any of these colors as a pile in the design of the carpet, this color is stuffed inside the carpet allocated to it.

To produce the pile carpets are the following:

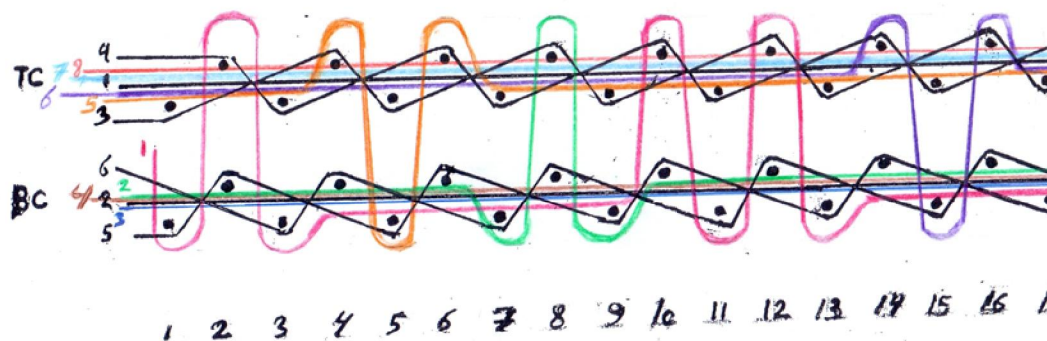


Figure (1): illustrates one of the textile structures used to produce pile carpets

First case: the pile produces from colors 1 or 2 or 3 or 4:

To configure the pile, pile yarn is lifted in distance between the two carpets, and there is an order of Jacquard device that pile warp yarn be above the even-numbered wefts of the two carpets (as shown in Figure 1).

In case of not emergence of any of these colors in the design are stuffed inside the back carpet, and that by being down even-numbered wefts and above odd-numbered wefts.

Second case: the pile produces from colors 5 or 6 or 7 or 8:

To configure the pile, pile yarn is relegated in distance between the two carpets, and there is an order of Jacquard device that pile warp yarn be down the odd-numbered wefts of the two carpets (as shown in Figure 1), This design processes are specified in figure (2).

In case of not emergence of any of these colors in the design are stuffed inside the face carpet, and that by being above odd-numbered wefts and down even-numbered wefts.

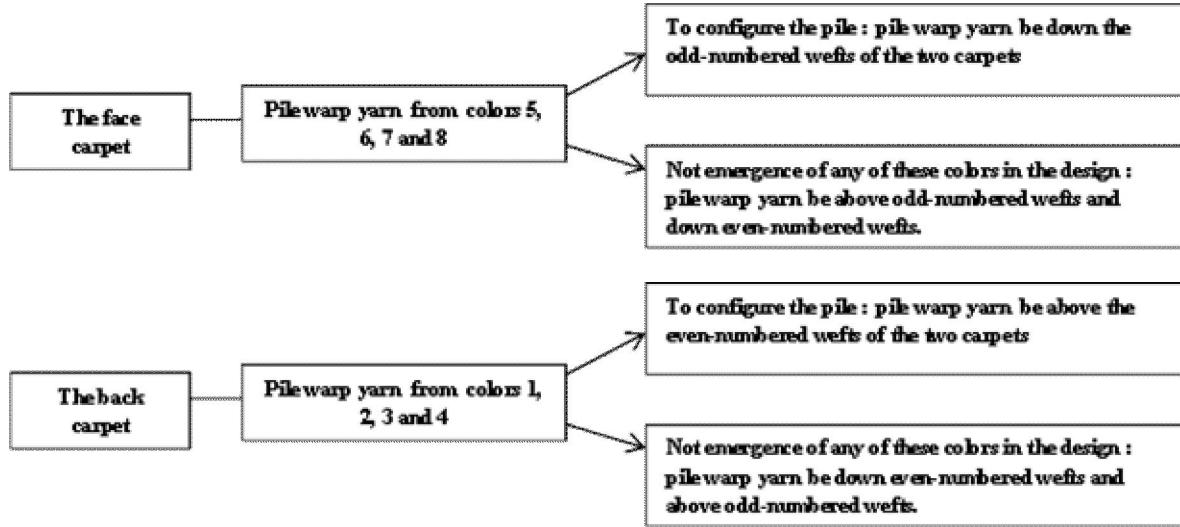


Figure (2) : The design processes for the production of pile carpets on face to face carpets machines

2-2 Design principles and methods for flat carpets:

The basic idea is based on flat pile warp yarns outside the distance between the two face to face carpets in a decorative form be prepared in previously.

Figure (3) illustrates one of the textile structures used to produce flat carpets, where the following notes:

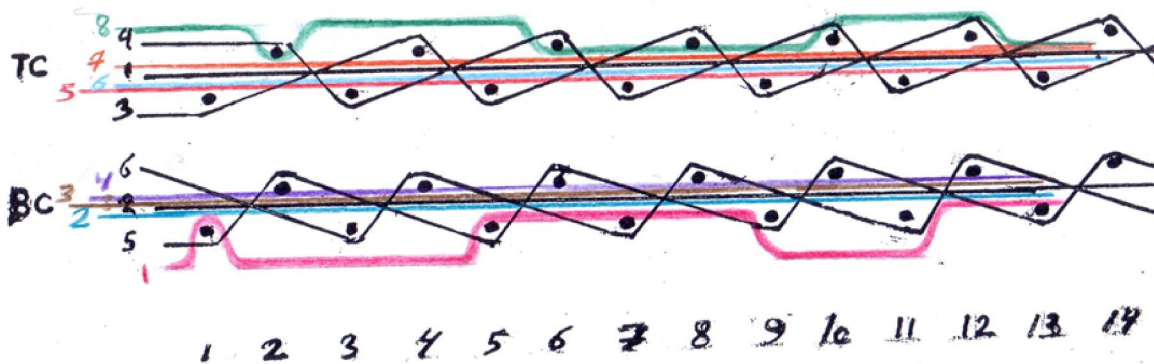


Figure (3) illustrates one of the textile structures used to produce flat carpets

Installation of the textile floor for each of the top carpet and back carpet be fixed is no different from the installation in figure (1).

In case of appearance pile warp as a flat pile on the back of the back carpet and not be exploited to obtain a pile from it or not filling it, there is an order of Jacquard device that pile warp yarn be down the odd and even-numbered wefts of the two carpets (as shown in Figure 3).

And in case of appearance pile warp as a flat pile on the back of the front carpet and not be exploited to obtain a pile from it or not filling it, there is an order of Jacquard device that pile warp yarn be above the odd and even-numbered wefts of the two carpets (as shown in Figure 3), This design processes are specified in figure (4).

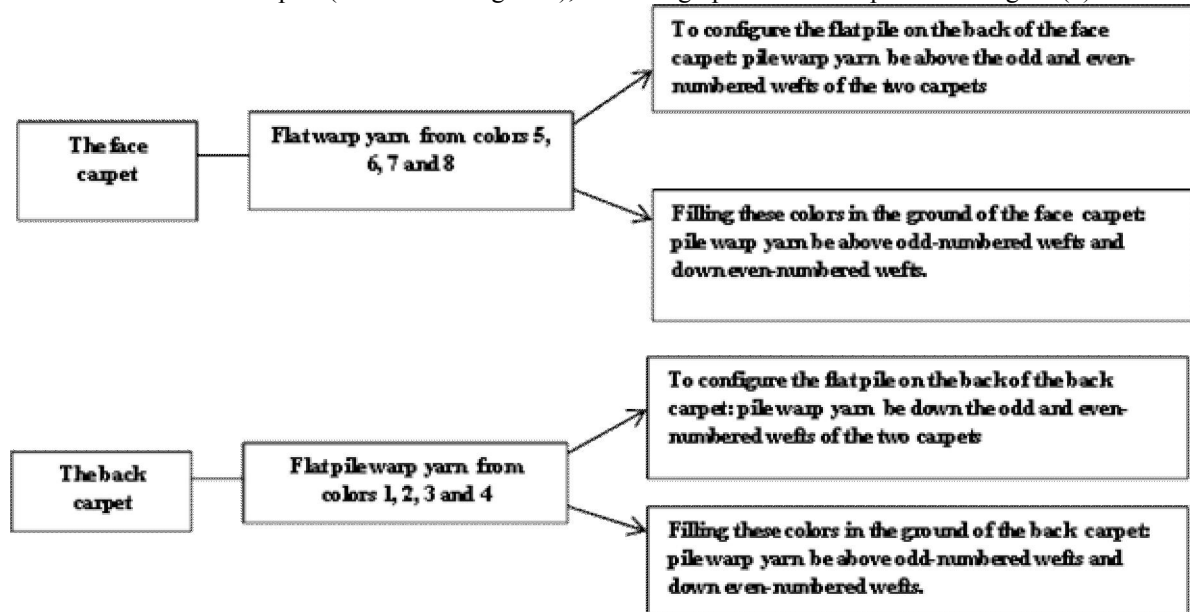


Figure (4): : The design processes for the production of flat carpets on face to face carpets machines

3-Experimental work :-

In this study, the flat floor coverings samples were produced on face-to-face carpets machines.

3-1 The specification of carpet machine used for producing samples under study:

The specification of carpet machine used for producing samples under study was shown in table (1).

Table (1) The specification of carpet machine used for producing samples under study:

Machine Name	face-to-face carpets machines CRM
The country of origin	Belgium
Name of the manufacturer	Michelle Van de Wiele
The shot method of weft yarns	double rapier double-shot weave
The type of Jacquard device	electronic Jacquard with 3 heeds
The set of the reed	3 dents /cm
Width of the machine	400 cm
Number of colors on the creel	8 colors
Number of wefts / cm	10/ cm

3-2 The specification of yarns used for producing samples under study:

The specification of yarns used for producing samples under study was shown in table (2).

Table (2) The specification of yarns used for producing samples under study:

chain warp yarn material	35% PET:65% cotton
chain warp yarn count	Ne 20/5
stuffing warp yarn material	35% PET:65% cotton
stuffing warp yarn count	Ne 20/5
Pile yarn material	100% polypropylene (B.C.F)
Pile yarn count	1150 denier
weft yarn material	100% jute
weft yarn count	Ne 16/2

3-3- The textile structures and designs used for producing samples under study:

In this research, has been producing a number of innovative designs that fit used as floor covering using the remnants of pile warp yarns in the factory, which in it has implemented these samples, and these designs are as follows:

3-3-1-The first and the second designs:

These designs have been produced on the machine and that the merger between the first textile structure as shown in Figure (5) which has been replicated in 3 dents in the comb of the machine, and the second textile structure as shown in Figure (6), which has been replicated in 1 dent in the comb of the machine, the height of wefts was 12 wefts per the first and the second structures, was arrangement the colors on the creel as shown in Figure (7) The first design as shown in Figure (8) represents the back carpet, and the second design as shown in Figure (9) represents the top carpet.

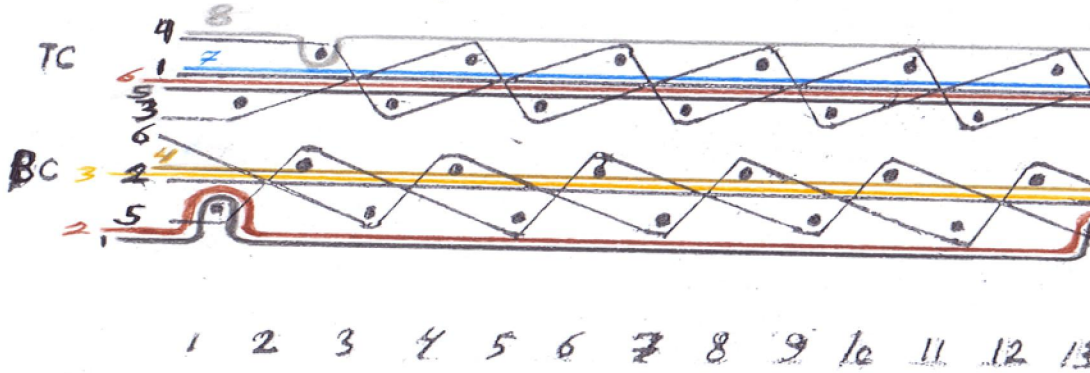


Figure (5) :The first textile structure which has been replicated in 3 dents

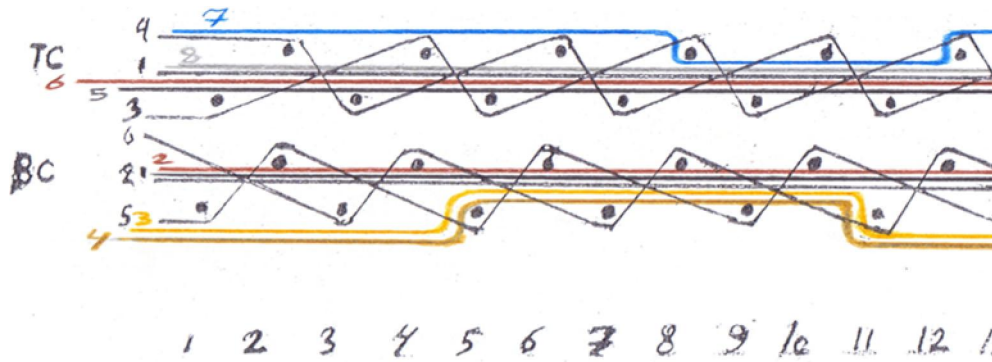


Figure (6) :The second textile structure which has been replicated in 1 dent

Cream	8
Blue	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (7): The arrangement of the colors on the creel

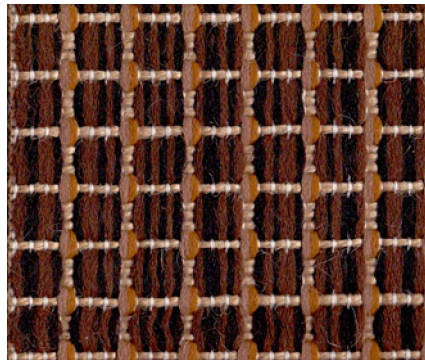


Figure (8): The first design which is the back carpet

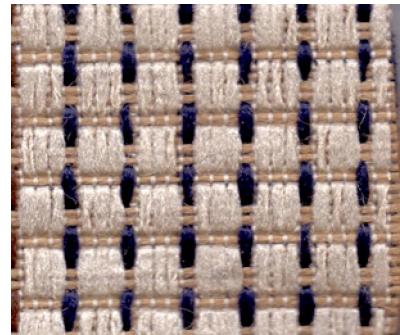


Figure (9): The second design which is the top carpet

3-3-2-The third and the fourth designs:

These designs have been produced on the machine and that the merger between the third textile structure as shown in Figure (10) which has been replicated in 3 dents in the comb of the machine, and the fourth textile structure as shown in Figure (11), which has been replicated in 1 dent in the comb of the machine, the height of wefts was 10 wefts per the third and the fourth structures, was arrangement the colors on the creel as shown in Figure (12).

The third design as shown in Figure (13) represents the back carpet, and the fourth design as shown in Figure (14) represents the top carpet.

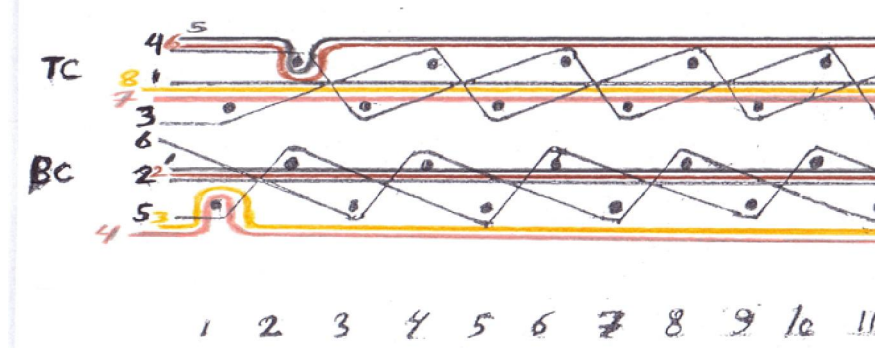


Figure (10) :The third textile structure which has been replicated in 3 dents

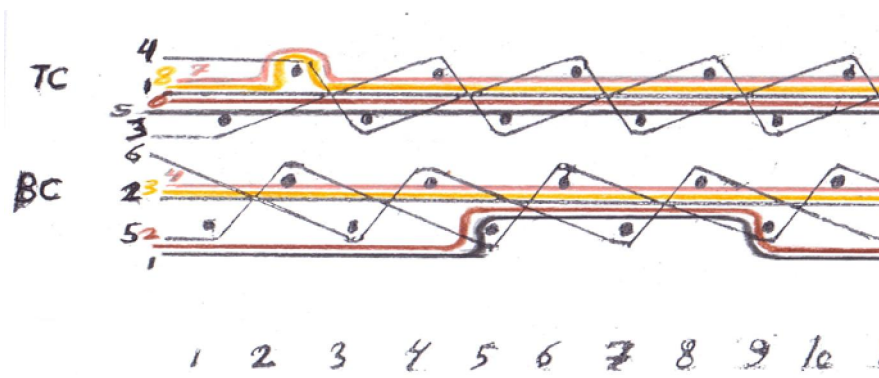


Figure (11) :The fourth textile structure which has been replicated in 1 dent

Gold	8
Beige	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (12): The arrangement of the colors on the creel

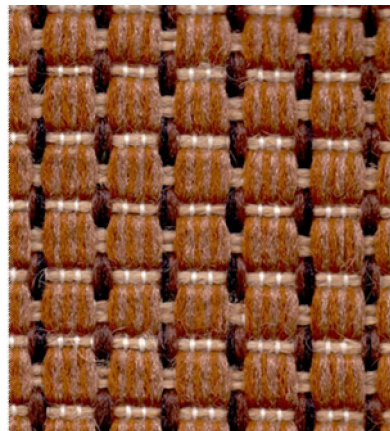


Figure (13)): The third design which is the back carpet

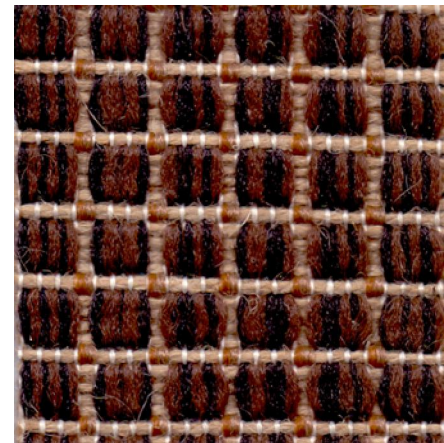


Figure (14)): The fourth design which is the top carpet

3-3-3-The fifth and the sixth designs:

These designs have been produced on the machine and that the merger between the fifth textile structure as shown in Figure (15) which has been replicated in 8 dents in the comb of the machine, and the sixth textile structure as shown in Figure (16), which has been replicated in 8 dents in the comb of the machine, the height of wefts was 12 wefts per the fifth and the sixth structures, was arrangement the colors on the creel as shown in Figure (17).

The fifth design as shown in Figure (18) represents the back carpet, and the sixth design as shown in Figure (19) represents the top carpet.

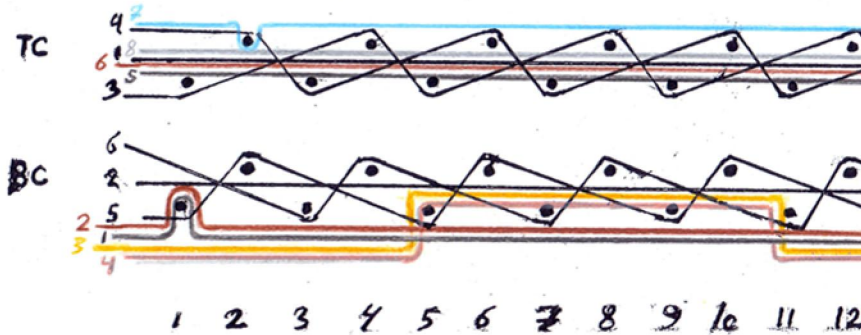


Figure (15): The fifth textile structure which has been replicated in 8 dents

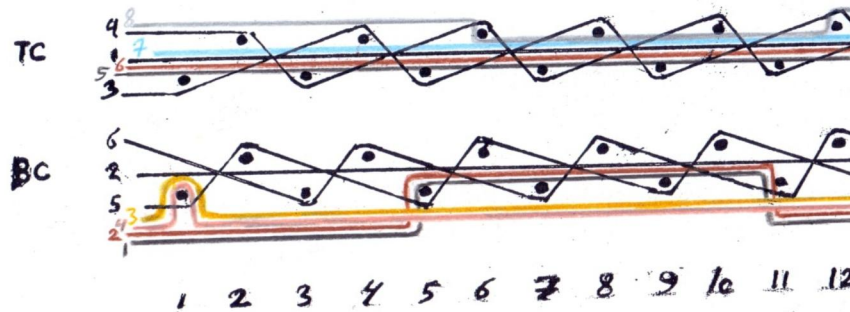


Figure (16): The sixth textile structure which has been replicated in 8 dents

Cream	8
Light blue	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (17):The arrangement of the colors on the creel

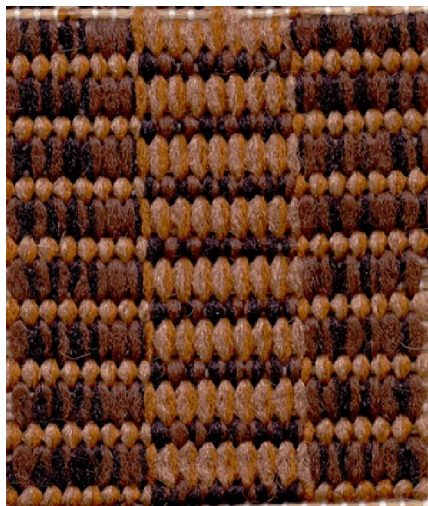


Figure (18): The fifth design which is the back carpet

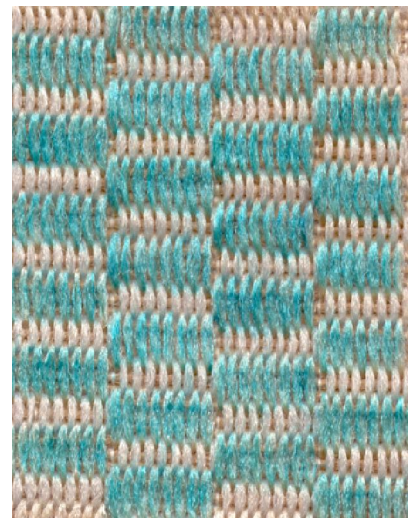


Figure (19): The sixth design which is the top carpet

3-3-4-The seventh and the eighth designs:

These designs have been produced on the machine and that the merger between the seventh textile structure as shown in Figure (20) which has been replicated in 8 dents in the comb of the machine, and the eighth textile structure as shown in Figure (21), which has been replicated in 8 dents in the comb of the machine, the height of wefts was 12 wefts per the seventh and the eighth structures, was arrangement the colors on the creel as shown in Figure (22).

The seventh design as shown in Figure (23) represents the back carpet, and the eighth design as shown in Figure (24) represents the top carpet.

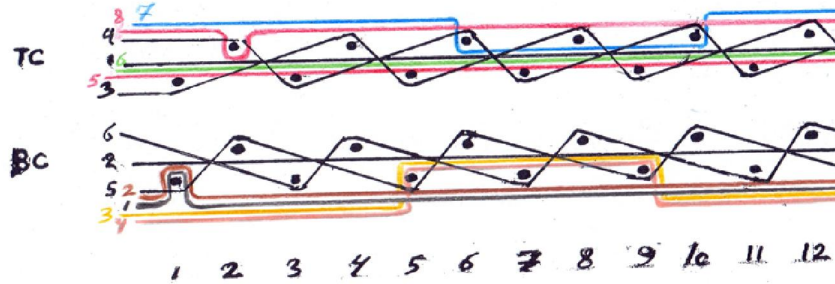


Figure (20): The seventh textile structure which has been replicated in 8 dents

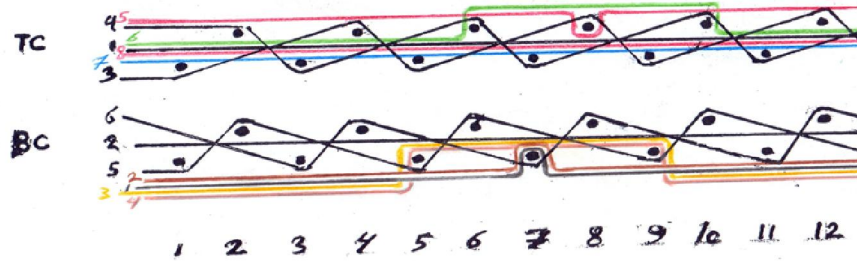


Figure (21): The eighth textile structure which has been replicated in 8 dents

Rose	8
Blue	7
Green	6
Red	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (22): The arrangement of the colors on the creel



Figure (23): The seventh design which is the back carpet



Figure (24): The eighth design which is the top carpet

3-3-5-The ninth and the tenth designs:

These designs have been produced on the machine and that the merger between the ninth textile structure as shown in Figure (25) which has been replicated in 6 dents in the comb of the machine, and the tenth textile structure as shown in Figure (26), which has been replicated in 2 dents in the comb of the machine, the height of wefts was 12 wefts per the ninth and the tenth structures, was arrangement the colors on the creel as shown in Figure (27).

The ninth design as shown in Figure (28) represents the back carpet, and the tenth design as shown in Figure (29) represents the top carpet.

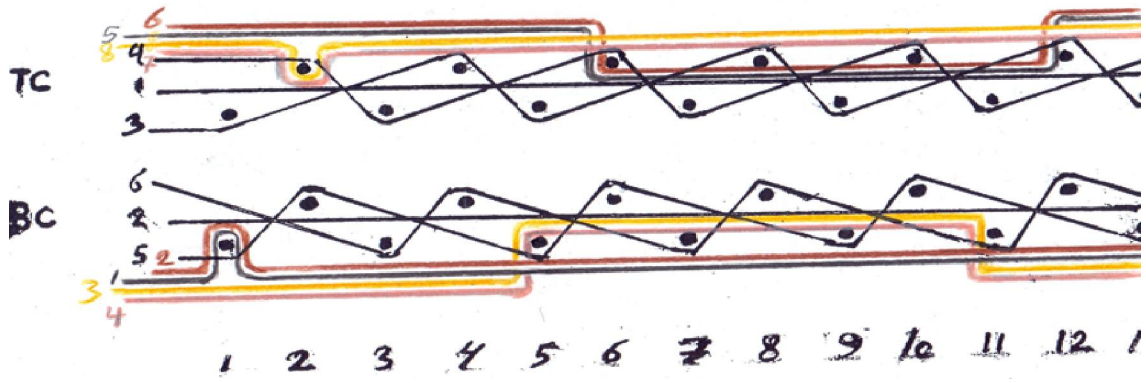


Figure (25): The ninth textile structure which has been replicated in 6 dents

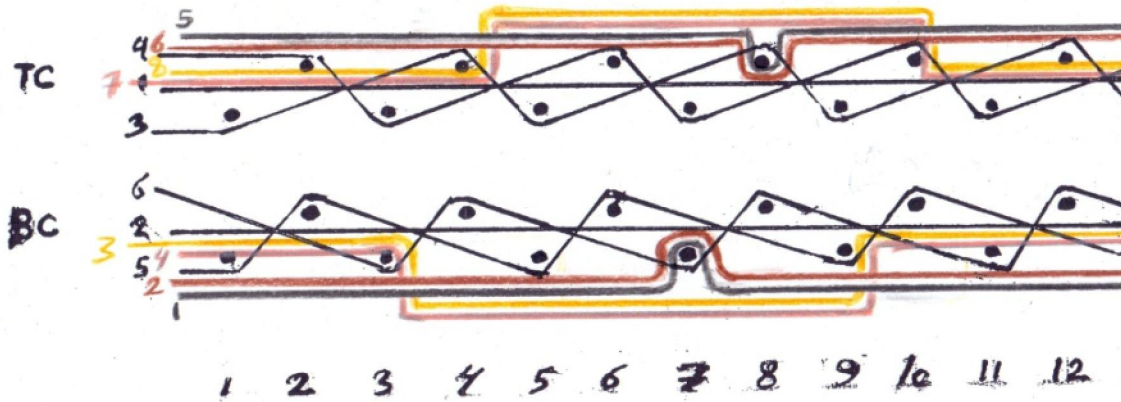


Figure (26): The tenth textile structure which has been replicated in 2 dents

Gold	8
Beige	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (27) : The arrangement of the colors on the creel

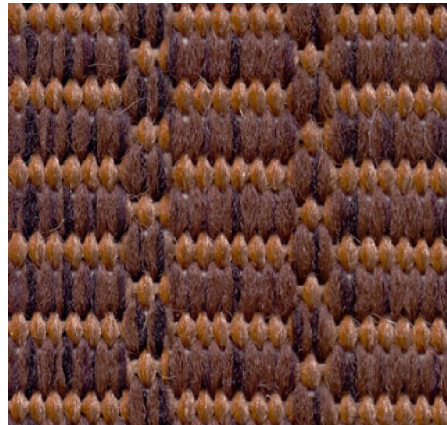


Figure (28): The ninth design which is the back carpet

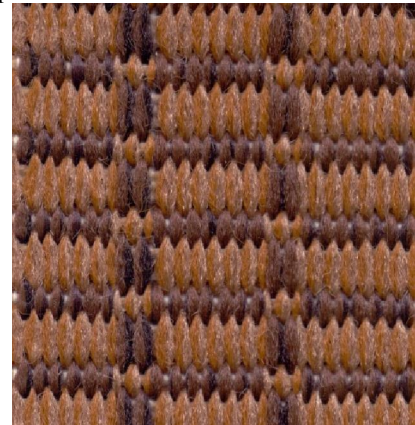


Figure (29): The tenth design which is the top carpet

3-3-6-The atheist and the twelfth designs:

These designs have been produced on the machine and that the merger between the atheist textile structure as shown in Figure (30) which has been replicated in 3 dents in the comb of the machine, and the twelfth textile structure as shown in Figure (31), which has been replicated in 1 dent in the comb of the machine, the height of wefts was 12 wefts per the atheist and the twelfth structures, was arrangement the colors on the creel as shown in Figure (32).

The atheist design as shown in Figure (33) represents the back carpet, and the twelfth design as shown in Figure (34) represents the top carpet.

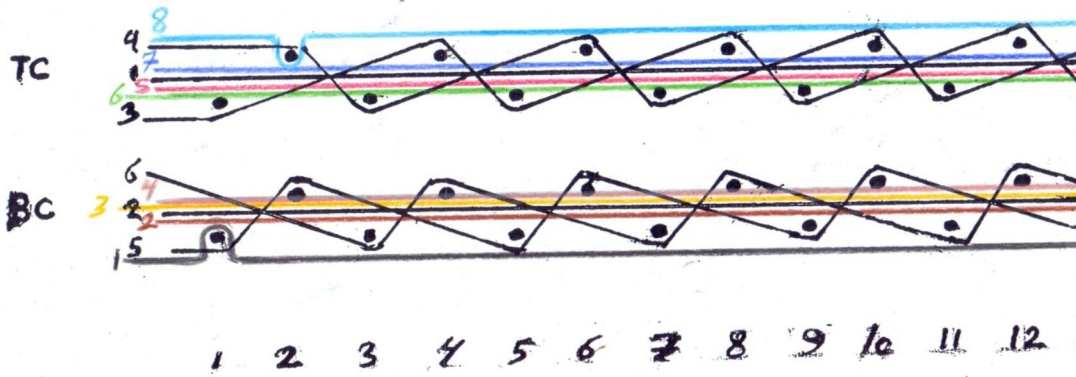


Figure (30): The atheist textile structure which has been replicated in 3 dents

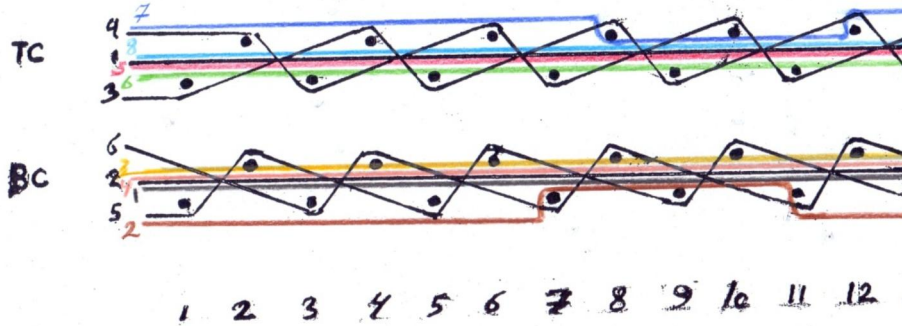


Figure (31): The twelfth textile structure which has been replicated in 1 dents

Light blue	8
Blue	7
Green	6
Red	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (32): The arrangement of the colors on the creel

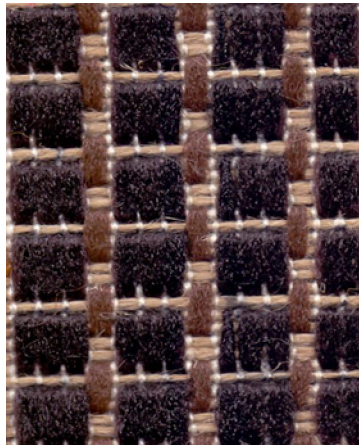


Figure (33): The atheist design which is the back carpet

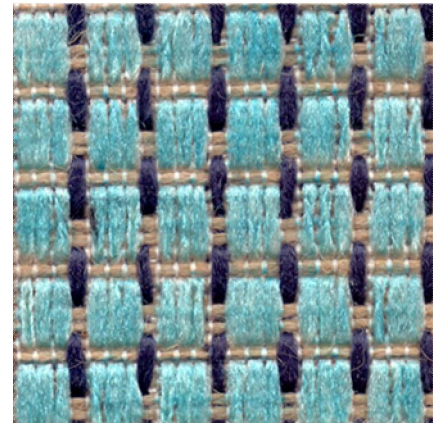


Figure (34): The twelfth design which is the top carpet

3-3-7-The thirteenth and fourteenth designs:

These designs have been produced on the machine and that the merger between the thirteenth textile structure as shown in Figure (35) which has been replicated in 12 dents in the comb of the machine, and the fourteenth textile structure as shown in Figure (36), which has been replicated in 12 dents in the comb of the machine, the height of wefts was 12 wefts per the thirteenth and the fourteenth structures, was arrangement the colors on the creel as shown in Figure (37).

The thirteenth design as shown in Figure (38) represents the back carpet, and the fourteenth design as shown in Figure (39) represents the top carpet.

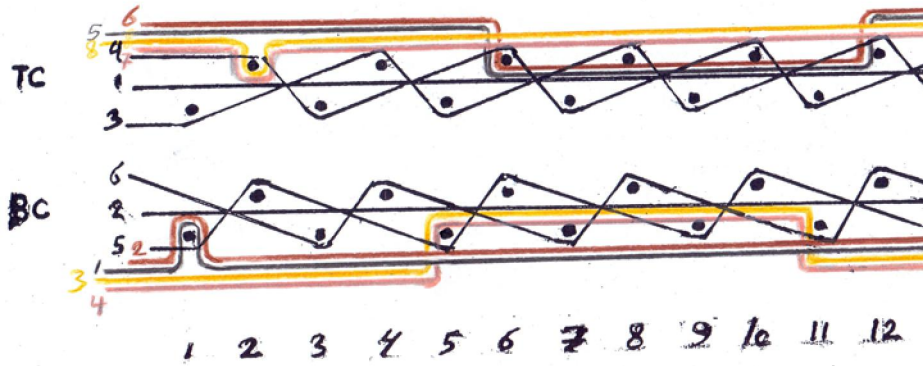


Figure (35): The thirteenth textile structure which has been replicated in 12 dents

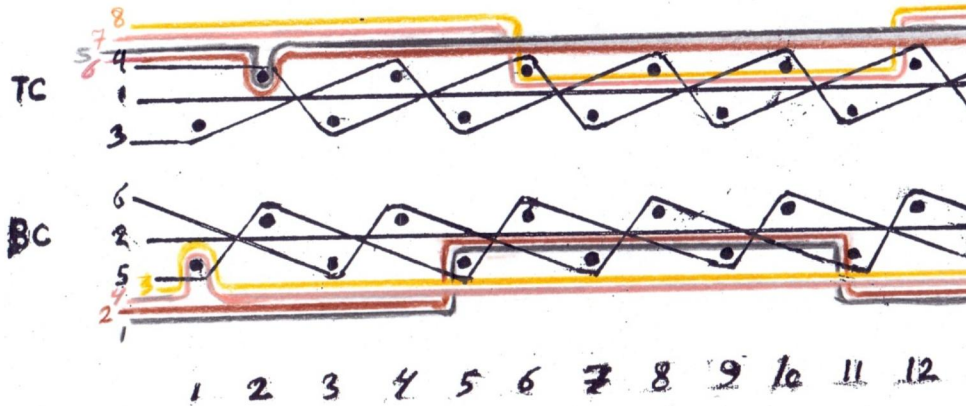


Figure (36): The fourteenth textile structure which has been replicated in 2 dents

Gold	8
Beige	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (37): The arrangement of the colors on the creel



Figure (38): The thirteenth design which is the back carpet



Figure (39): The fourteenth design which is the top carpet

3-3-8-The fifteenth design:

This design has been produced on the machine and that the merger between the fifteenth textile structure as shown in Figure (40) which has been replicated in 1 dent in the comb of the machine, and the sixteenth textile structure as shown in Figure (41), which has been replicated in 1 dent in the comb of the machine, and the seventeenth textile structure as shown in Figure (42), which has been replicated in 1 dent in the comb of the machine, the height of wefts was 12 wefts per the fifteenth, the sixteenth structures, and the seventeenth structures, was arrangement the colors on the creel as shown in Figure (43).

In this case the textile structure and colors were installed this resulted in the same design for each of the top carpet and back carpet as shown in Figure (44).

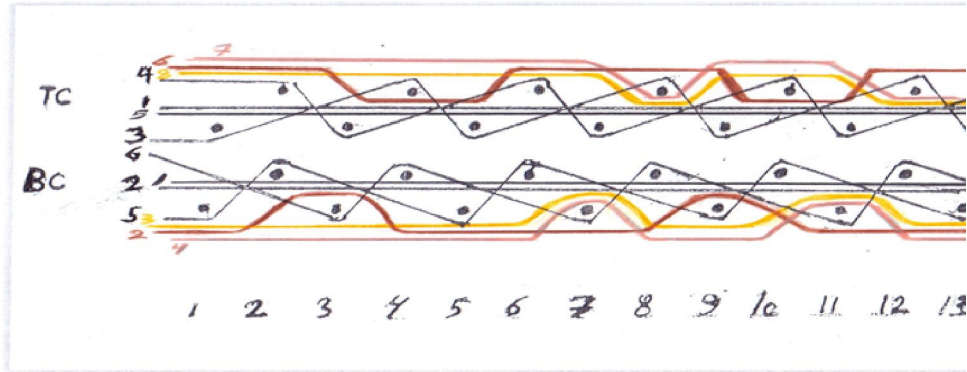


Figure (40): The fifteenth textile structure which has been replicated in 1 dent

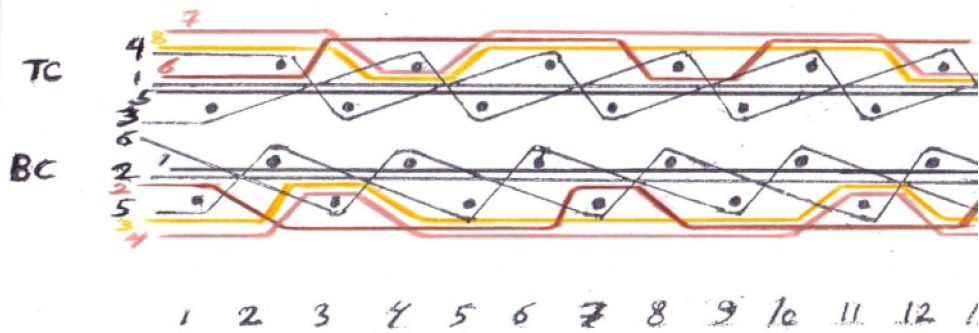


Figure (41): The sixteenth textile structure which has been replicated in 1 dent

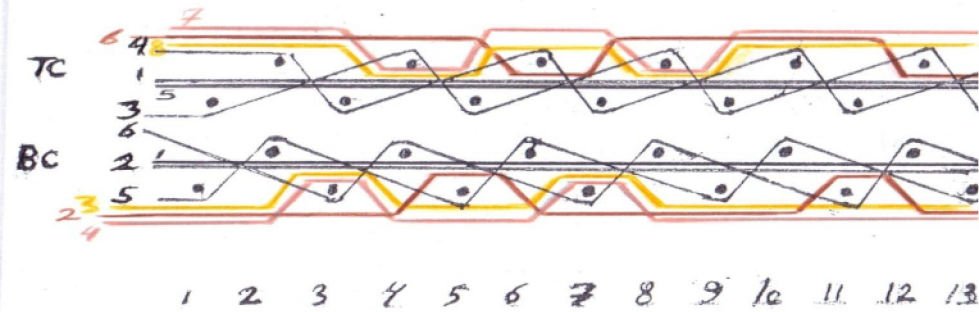


Figure (42): The seventeenth textile structure which has been replicated in 1 dent

Gold	8
Beige	7
Brown	6
Black	5
Beige	4
Gold	3
Brown	2
Black	1

Figure (43): The arrangement of the colors on the creel

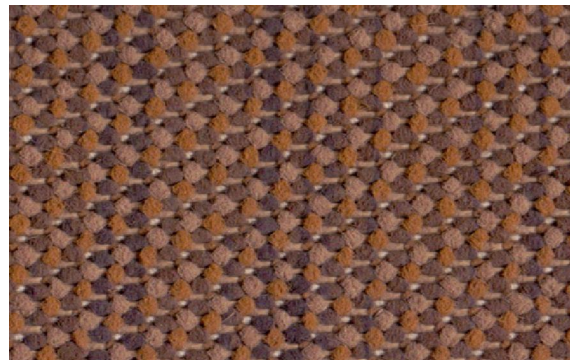


Figure (44): The fifteenth design which represents the back carpet and the top carpet

3-3-9-The sixteenth design:

This design has been produced on the machine and that the merger between the eighteenth textile structure as shown in Figure (45) which has been replicated in 2 dents in the comb of the machine, and the nineteenth textile structure as shown in Figure (46), which has been replicated in 2 dents in the comb of the machine, the height of wefts was 6 wefts per the eighteenth, and the nineteenth structures, was arrangement the colors on the creel as shown in Figure (47).

In this case the textile structure and colors were installed this resulted in the same design for each of the top carpet and back carpet as shown in Figure (48).

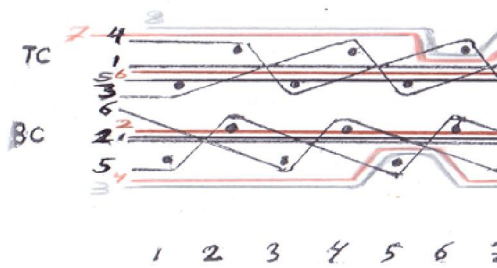


Figure (45): The eighteenth textile structure which has been replicated in 2 dents

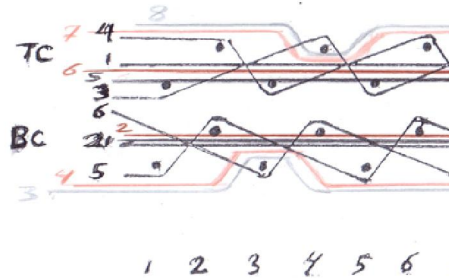


Figure (46): The nineteenth textile structure which has been replicated in 2 dents

Cream	8
Beige	7
Brown	6
Black	5
Beige	4
Cream	3
Brown	2
Black	1

Figure (47): The arrangement of the colors on the creel



Figure (48): The sixteenth design which represents the back carpet and the top carpet

3-4-Testing methods:-

In this paper we used the existing methods to measure the portability of samples produced under the study for the functional performance to multiple purposes.

3-4-1-Laboratory Testing:-

- Determination of samples weight:

This test was carried out by using Metter PI 200 according to the American Standard specifications of (ASTM-D3776-85) ⁽⁸⁾. The average of 5 readings for each sample was used.

- Determination of samples thickness:

This test was carried out by using Helios Tester according to the American Standard specifications of (ASTM-D1777-64) ⁽⁹⁾. The average of 5 readings for each sample was used.

- Determination of samples abrasion resistance:

This test was carried out by using Rubtester Computext according to the American Standard specifications of (ASTM-D4158-92) ⁽¹⁰⁾. The average of 5 readings for each sample was used until wear out.

3-4-2-- Results and discussion:-

Results of experimental tests carried out on the produced samples were presented in table (3) and Figure (49).

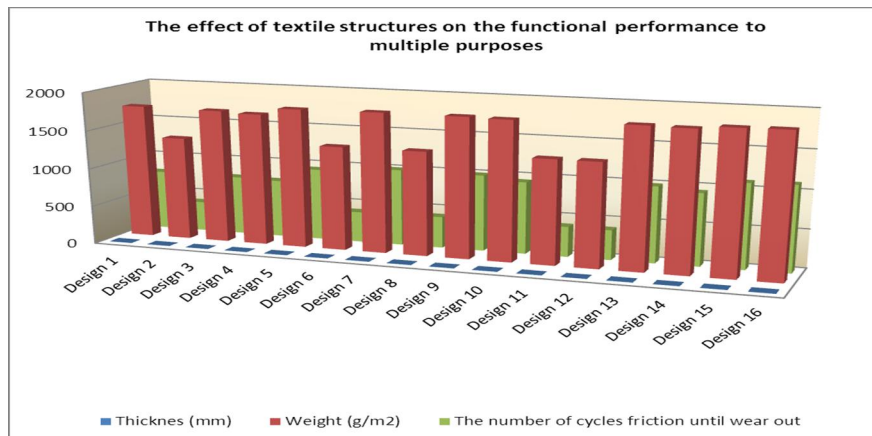


Figure (49): The effect of the samples textile structures on the functional performance to multiple purposes

Table (3): Results of the effect of the samples textile structures on the functional performance to multiple purposes.

Design No.	Thickness (mm)	Weight (g/m2)	The number of cycles friction until wear out
1	4.08	1750	780
2	3.99	1350	390
3	4.07	1740	770
4	4.06	1720	755
5	5.03	1810	940
6	4.02	1354	400
7	5.05	1820	1000
8	4.4	1355	410
9	5.05	1820	995
10	5.03	1810	940
11	4.01	1352	395
12	3.99	1351	390
13	5.06	1820	990
14	5.03	1810	940
15	5.09	1845	1100
16	6.01	1850	1110

- Through table (3) and figure (49) can be divided the samples of designs produced under study into three groups, and each group includes samples that are converging significantly in the final results of the test which conducted on them, and these three groups were:

The first group includes designs 2, 6, 8, 11 and 12.

The second group includes designs 1, 3 and 4.

The third group includes designs 5, 7, 9, 10, 13, 14, 15 and 16.

- The highest value for the thickness, weight and resistance to friction were achieved in the samples of the third group, and the interpretation of this is due to that the designs at the third group were executed by merger between the textile structures depend on the emergence of 2 warp yarns in each dent at the comb on the machine and the result is to double the number of warp yarns in the unit of measurement and thus increasing the intensity on the face of design, Accordingly the increase of both the weight and thickness of samples and therefore more resistant of samples to friction which increases susceptibility to the functional performance to multiple purposes.

- Samples of the second group achieved values less than the values of the results of samples of the third group, the explanation for this is because that although the designs in the second group depends on the emergence of two warp yarns in each dent of the comb, but it's there a very few of rows that do not have any emergence of warp yarns on the face of design which would lead to fewer yarns warp in the unit of measure and therefore less density and consequent reduced of both the weight and thickness of the samples, the result of this less resistant to friction compared with the samples at the third group.

- The Lowest value for the thickness, weight and resistance to friction were achieved in the samples of the first group, and the interpretation of this is due to that the designs at the first group were executed by merger between the textile structures depend on the emergence of 1 warp yarn in each dent at the comb on the machine and the result is decrease the number of warp yarns in the unit of measurement and thus decreasing the intensity on the face of design, Accordingly the decrease of both the weight and thickness of samples and therefore less resistant of samples to the friction.

3-5- Questionnaire to assess the designs produced under study:

Questionnaire was designed containing 7 axes to evaluate the design of this research, was presented the questionnaire to thirty airtight divided evenly between specialists of industrial experts, sale experts for qualities similar products, and consumers, Table (4) shows the model of the questionnaire used in the study.

Table (4): The model of the questionnaire used to assess the designs produced under study.

NO.	Axes of questionnaire	Respondents saw	
		Agree	Disagree
1	Design contains units consistent		
2	Colors are consistent, attractive and free from obvious flaws		
3	Design gives comfortably rhythm to consider		
4	The raw material used is suitable for texture and design		
5	Design is suitable for the functional performance to multiple purposes		
6	Design appropriate to the local environment		
7	Marketing design as possible locally and externally		

3-5-1- Opinion poll results:

Table (5) shows opinion poll results through the previous questionnaire, and the numbers registered in the table indicate to the percentage recorded for each of seven Axes to 16 design has been implemented.

Table (5): The percentage recorded for each Axis from questionnaire to designs have been implemented.

Design No.	The percentage recorded to each of seven Axes for questionnaire						
	1	2	3	4	5	6	7
1	96.6	93.3	100	90	90	96.6	96.6
2	93.3	100	100	93.3	86.6	93.3	96.6
3	96.6	93.3	96.6	93.3	96.6	96.6	96.6
4	86.6	96.6	86.6	93.3	96.6	93.3	93.3
5	96.6	96.6	100	100	96.6	96.6	93.3
6	90	96.6	96.6	83.3	86.6	80	93.3
7	100	100	100	100	96.6	93.3	96.6
8	83.3	70	70	83.3	66.6	76.6	76.6
9	96.6	100	96.6	96.6	96.6	96.6	100
10	96.6	100	100	100	96.6	100	96.6
11	86.6	83.3	80	66.6	66.6	86.6	86.6
12	96.6	100	96.6	90	93.3	86.6	90
13	100	100	100	96.6	96.6	93.3	93.3
14	100	100	96.6	96.6	96.6	93.3	90
15	90	96.6	93.3	93.3	93.3	93.3	93.3
16	100	100	100	100	86.6	96.6	96.6

3-5-1-1- The percentage achieved by each design through the opinion poll:

Results of evaluation of the arbitrators for designs implemented under the search illustrated by Figure (50).

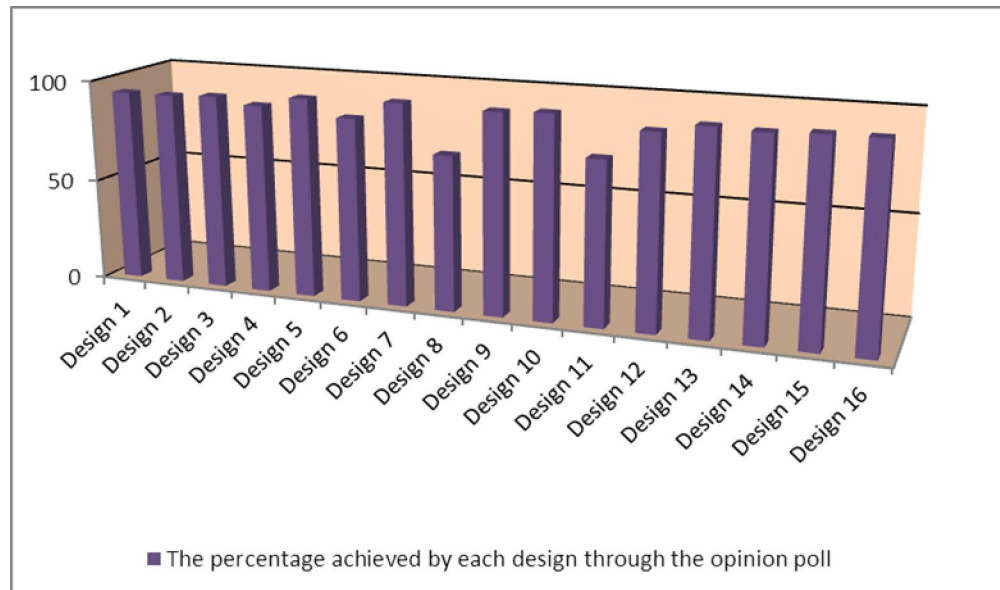


Figure (50): Results of evaluation of the arbitrators for designs implemented under the search

3-5-1-2- The percentage achieved for each Axis from questionnaire through the opinion poll:

Results of evaluation of the arbitrators for each Axis from questionnaire for all designs have been implemented illustrated by Figure (51).

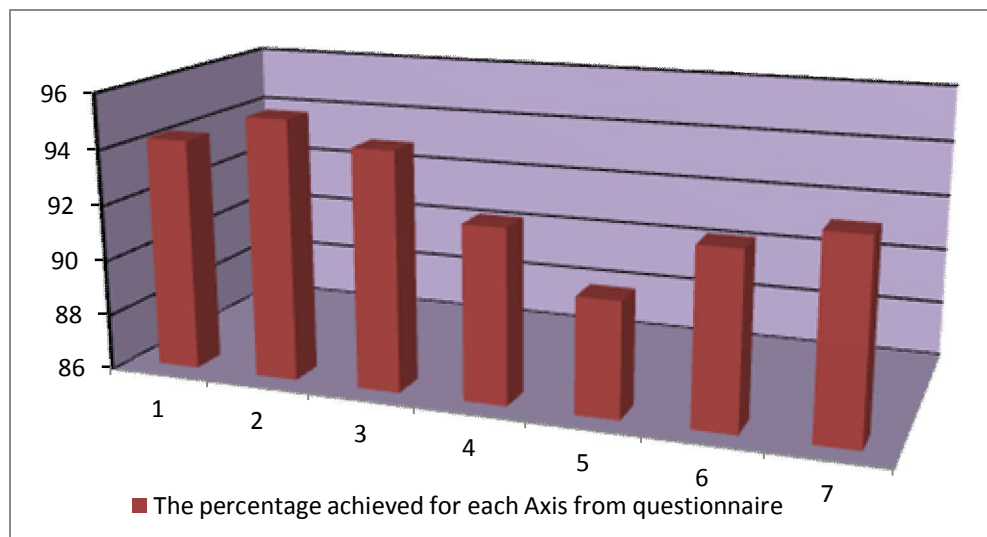


Figure (51): The percentage achieved for each Axis from questionnaire for all designs under study

Through the previous figure reflected the following results:

-The first axis (Design contains units consistent):
The views of the arbitrators corresponded at rate of 94.3% on the designs implemented under study containing units consistent

-The second axis (Colors are consistent, attractive and free from obvious flaws):
The views of the arbitrators corresponded at rate of 95.3% on the designs implemented under study have colors consistent, attractive and free from obvious flaws.

-The third axis (Design gives comfortably rhythm to consider):

-The views of the arbitrators corresponded at rate of 94.5% on the designs implemented under study give comfortably rhythm to consider.

-The fourth axis (The raw material used is suitable for texture and design):

The views of the arbitrators corresponded at rate of 92.2% on the raw material used is suitable for texture and designs implemented under study.

-The fifth axis (Design is suitable for the functional performance to multiple purposes):

The views of the arbitrators corresponded at rate of 90.1% on the designs implemented under study are suitable for the functional performance to multiple purposes.

-The sixth axis (Design appropriate to the local environment):

The views of the arbitrators corresponded at rate of 92.2% on the designs implemented under study appropriate to the local environment.

-The seventh axis (Marketing design as possible locally and externally):

The views of the arbitrators corresponded at rate of 93% on marketing for designs implemented under study as possible locally and externally.

4-Conclusion:-

Design new products on face to face carpet machines is something very interesting for those interested in this field in the textile industry, In this research innovation has been a number of designs that are suitable for use as a flat floor coverings, this was on face to face machine carpets, the quality of double shot, Where was performed 16 designs, This by merger between different textile structures based on Flattening pile warp yarns outside the distance between the two face to face carpets in a decorative form be prepared in previously, Some of these designs have been produced so that the top carpet is different from the back carpet, which are produced at the same time, and the others top carpet similar with back carpet.

Regarding the textile structures that have been used some of them depends on the emergence and flattening of one warp yarn in each dent at the comb on the machine and others depends on the emergence and flattening 2 warp yarns in each dent.

To produce designs under study used the remnants of pile warp yarns in the place of production. These yarns each color of which contains multiple degrees when used for the production of pile carpet the result is obvious flaws, especially in carpet designs with wide color spaces. Consequently, found the idea of this research for exploitation of these yarns in the implementation of the kind of these designs under study.

We used the existing methods and laboratory tests to measure the portability of samples produced under the study for the functional performance to

multiple purposes. Through the results can be divided the samples of designs produced under study into three groups, and each group includes samples that are converging significantly in the final results of the test which conducted on them.

- The highest value for the thickness, weight and resistance to friction were achieved in the samples of the third group as the designs at this group were produced by merger between the textile structures depend on the emergence of 2 warp yarns in each dent at the comb on the machine.

Questionnaire was designed containing 7 axes to evaluate the designs of this research, was presented the questionnaire to thirty airtight, Based on statistical analysis of the outcome of this questionnaire the samples produced under study achieved a high rate of acceptance of arbitrators.

References:-

1. Cohen, M. – The world of carpets – Random House Value Publishing, Inc – New jersey -1996.
2. De Marinis, F., velvet – History, Techniques, Fashions – Idea Books – Italy – 1994.
3. Kienbaum, M. – Jacquard Technology with Electronic control – ITB International Textile Bulletin- yarn and fabric forming – No. 2 – P.49 – 58 – 1994.
4. Dempsey, E. – Automation in carpet weaving – ITB International Textile Bulletin- Vol. 44 – No. 4 – P.62 – 63 – 1998.
5. Watson, W. - Advanced Textile Design (Textile Design and Colour – Long mans, Green and co – London – 1913.
6. Word, D. T. - carpet machinery builders combine versatility with productivity – ITB International Textile Bulletin- Vol. 45– No. 4 – P.69 – 70 – 1999.
7. Demey, S. - New generation carpet weaving machines combine flexibility and productivity ITB International Textile Bulletin- Vol. 46– No. 1 – P.48 – 50 – 2000.
8. ASTM-D3776-85, American Standard specifications for determining the carpet weight.
9. ASTM-D1777-64, American Standard specifications for determining the carpet thickness.
10. ASTM-D4158-92, American Standard specifications for determination of fabric abrasion resistance.

12/12/2013