

[54] **METHOD OF MAKING YARN SHADE CARDS**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 131,729, April 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 772,949, Nov. 4, 1968, abandoned.

[52] U.S. Cl. **156/178**, 35/28.3, 35/50, 35/55, 156/269, 156/290, 161/36, 161/143, 161/146, 161/147, 161/149, 206/460, 206/471

[51] Int. Cl. **B32b 5/08**, B32b 31/18

[58] Field of Search 206/82, 44.11, 460, 471; 35/15, 28.3, 28.5, 50, 55, 56; 161/36, 143, 142, 146, 147, 149; 156/178, 269, 290

[56]

References Cited

UNITED STATES PATENTS

1,527,712	2/1925	Steinthal	206/82
2,493,968	1/1950	Hepner	161/123
2,670,843	3/1954	Steinthal	206/82

FOREIGN PATENTS OR APPLICATIONS

461,973	2/1937	Great Britain	35/55
87,592	4/1956	Norway	206/44.11

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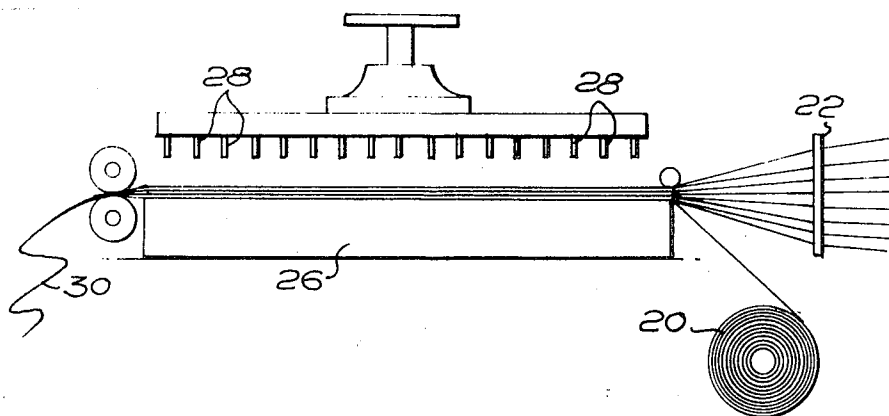
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[57]

ABSTRACT

Fibrous yarn shade card and method of making by placing yarns in side by side array on a synthetic resin backing and bonding by heat and pressure along a transverse heat sealing line which anchors the yarn fibre along the line. A plastic cover sheet may be bonded at the same time to provide a cover strip for the card.

1 Claim, 5 Drawing Figures



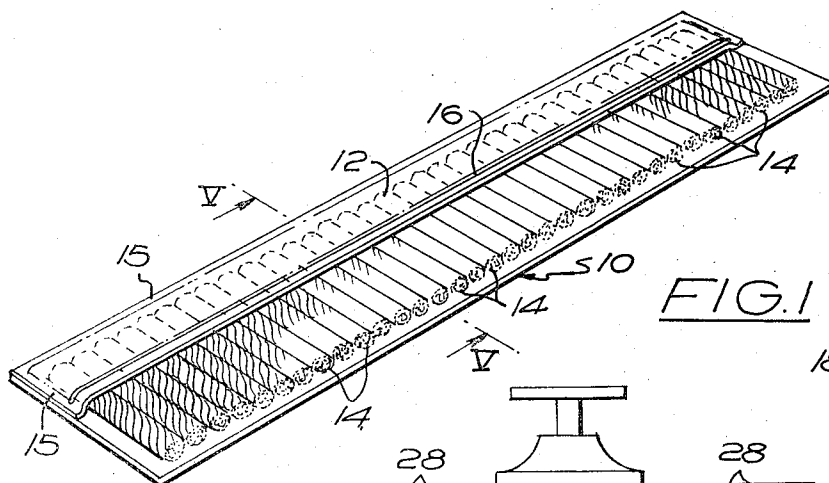


FIG. 1

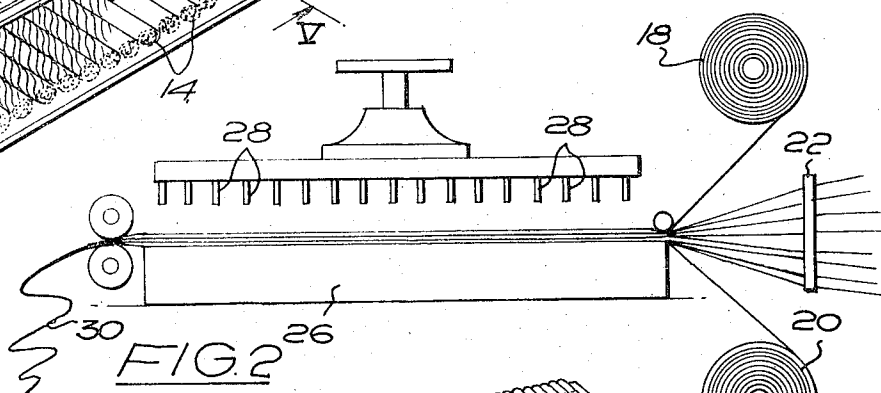


FIG. 2

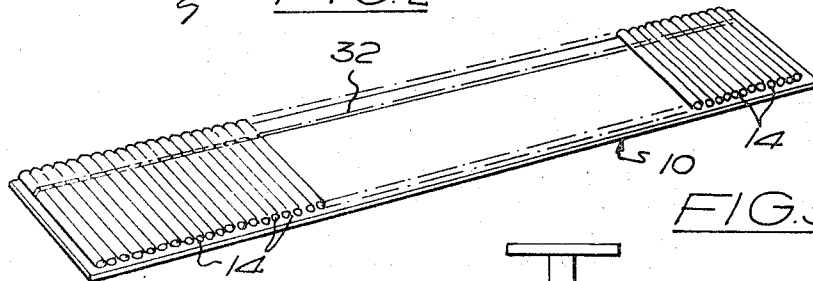


FIG. 3

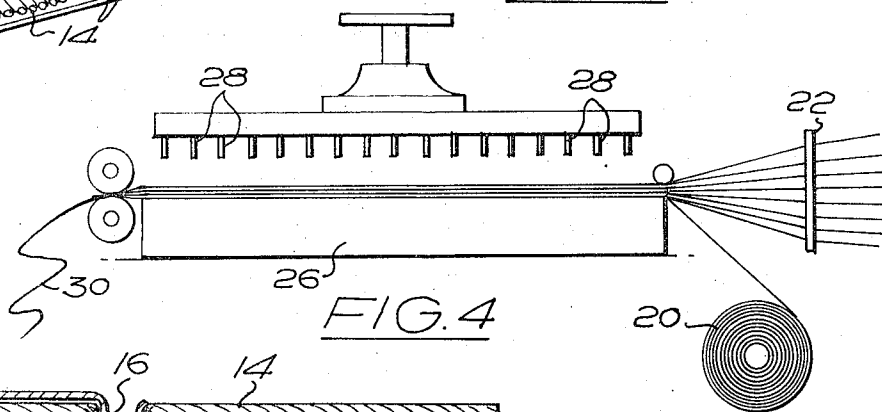


FIG. 4

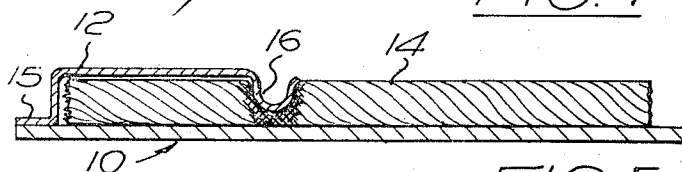


FIG. 5

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METHOD OF MAKING YARN SHADE CARDS

The present invention relates to a fibrous yarn shade card and to a method of making the same and constitutes a continuation-in-part of our application Ser. No. 131,729 filed Apr. 6, 1971, which is in turn a continuation-in-part of our application Ser. No. 772,949 filed Nov. 4, 1968, both now abandoned. The term "yarn" is used throughout this specification to include any suitable material, whether spun or filament threads or fibres or otherwise.

Shade cards are used for displaying colour shades of yarns such as wool yarns, and usually comprise a plurality of tufts of yarns, e.g. wool disposed side by side and parallel. The tufts are carried by a strip of card which is wrapped round the tufts at one end thereof so that the tufts protrude from the card and to which the tufts are glued.

This known wool card suffers from several disadvantages, one being that it takes too long to make and another being that it is too expensive to manufacture.

It has been proposed, for example in British Pat. No. 461,973 (Hirst) to produce yarn pattern cards in which the yarn samples are laid on a backing sheet of woven fabric the entire surface of which sheet has been coated with an adhesive, and the whole of each yarn sample is adhered to the fabric sheet by the application of heat to the adhesive coating from one of two rollers between which the sheet and yarns are passed.

This method of sticking the yarns on the backing sheet has the same disadvantages as have been mentioned above. Moreover, the efficiency of this last method depends upon the satisfactory adhesion not only between the adhesive coating and the yarns but also between the coating and the backing sheet, and in addition the application of the coating to the sheet involves an additional step in the process, whilst a still further step is involved in subsequently adhering narrow strips cut off this backing sheet with its stuck-down assembly of yarn patterns to a card to form the finished pattern or display card. Also, this last method has the further disadvantage that substantially no part of the yarn samples is left free to be handled and untouched by the adhesive.

It has also been proposed in U.S. Pat. No. 2,493,968 (Hepner) to secure a batt of steel wool to a backing sheet of cloth, paper or the like having a separate adhesive coating on one surface thereof, and to secure the batt at intervals to the sheet by application of heat and pressure. This patent refers specifically to the production of steel wool scouring pads and the only consideration is the mechanical one of securing the metal fibres to the backing sheet to make pads which can be used for scouring pans, etc. This patent does not refer to shade cards or sample cards and makes no reference to yarns to fibres of textile materials for mounting on such cards, and therefore does not teach the inventive concept of the present application.

In a further proposal in U.S. Pat. No. 1,527,712 (M. Steinthal) a yarn sample card is produced by securing the inner ends of yarn tufts between the edges of two sheets of material by glue, paste or adhesive which also secures the sheets together, leaving part of the tufts projecting for examination and handling. This construction has the disadvantages already hereinbefore referred to with regard to time and expense of production.

In another proposal in U.S. Pat. No. 2,670,843 (M. B. Steinthal) cloth samples are mounted on a backing sheet by removably attaching them to or tucking them beneath retainer strips which are secured to a cardboard carrier in such a manner that the samples are free to be removed for inspection and then replaced. The samples are not permanently secured to the carrier or backing sheet and there is no reference to heat-sealing of any part of the carrier or samples.

It is an object of this invention to enable fibrous yarn shade cards to be produced rapidly in an improved form and in particular in a form which is very simple and cheap and yet effective in displaying the yarns to sight and touch.

It is a further object of this invention to produce fibrous yarn shade cards in which the yarns are secured to a backing sheet in such a manner as to leave the major portion of the yarns untouched by any adhesive substance, whereby the texture and colour of such major portion of the yarns are unimpaired by the adhesion process.

A still further object of this invention is to provide a method of manufacturing fibrous yarn shade cards in a form resulting in the advantages hereinbefore referred to, which method will be described hereinafter in detail.

In order to achieve these objects we mount the fibrous yarn samples on a backing sheet of synthetic thermoplastic material and use the material of the sheet itself to bond the samples thereto by local application of heat and pressure along a narrow band or line transverse to the length of the side-by-side parallel assembly of yarns or tufts to heat-seal each yarn or tuft to the sheet, thereby leaving most of each sample untouched and unaffected by the bonding process. The material of the backing sheet itself is thus fused into the spaces between the fibres or filaments of the yarns and thus produces a firm bond which is much superior and more simply effected than could be obtained by using glue or other applied adhesives. However, each yarn sample is only thus secured at one point to the backing sheet, thereby leaving most of the sample untouched by the bonding medium and therefore free to be handles for judging the feel of the yarn.

This concept of using a heat-sealable backing sheet and bonding the samples thereto simply by applying heat and pressure along a narrow band has not previously been proposed so far as we are aware in spite of the existing-knowledge extending over many years as to the uses of heat-sealing for bonding articles together, and we have produced according to this invention fibrous yarn shade cards of a commercially successful and advanced construction which have filled a long-standing need.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 is a perspective view of a yarn shade card according to the invention;

FIG. 2 is a diagrammatic side view of apparatus for use in making shade cards as illustrated in FIG. 1;

FIGS. 3 and 4 are views similar to FIGS. 1 and 2 showing respectively another embodiment of a yarn shade card according to the invention; and

FIG. 5 is a cross-section on an enlarged scale taken on the line V — V in FIG. 1.

In the two embodiments now referred to the shade cards have yarn tufts of wool, and in the interests of simplicity, reference is made only to wool tufts. However, it will be appreciated that the yarn tufts of wool can be replaced by tufts of any natural or synthetic fibrous yarns.

Referring firstly to FIG. 1, a wool shade card comprises a white backing sheet 10 of synthetic thermoplastic material (for example polyvinylchloride) having heat-sealed thereto a preferably transparent front cover sheet 12 to form an overlay of the same length as but less than half the width of the backing sheet 10. Trapped between the front sheet 12 and backing sheet 10 are a plurality of individual wool yarn tufts 14 which lie side by side and parallel to one another to form an array thereof.

The front sheet 12 is heat-sealed along its periphery 15 to the backing sheet 10 and the longitudinal line of sealing 16 extends transversely to the length of the tufts and across same. In performing the heat-sealing welding electrodes apply heat and pressure along the periphery 15, including the line 16 and the thermoplastic material is then rendered fluent so that it fuses into the fibres of the wool and the spaces therebetween along line 16 and so when the fluent thermoplastic material again sets, the tufts 14 are effectively anchored on the card and the sheets 10 and 12 secured together.

The result is clearly shown in FIG. 5 where the material of the backing sheet 10 is fused through and between the tufts 14 along the transverse line 16 to secure the tufts and the front sheet 12 to said backing sheet.

FIG. 2 shows diagrammatically apparatus for use in making simultaneously a number of shade cards as illustrated in FIG. 1. The apparatus comprises two rolls of synthetic thermoplastic material 18, 20 in web form disposed one above the other. The upper roll 18 is of preferably transparent thermoplastic sheet for forming front sheets 12 in the finished cards, whilst the lower roll carries white synthetic thermoplastic material for forming the backing sheets 10 of the cards.

Between the rolls 18, 20 there is a reed 22 through which continuous wool yarns 24 of different colours or shades are passed from a creel (not shown). The yarns are spread out by the reed into the form of a web with the yarns extending parallel to one another. The web of yarns is sandwiched between the synthetic plastics webs from rolls 18, 20 and the composite sandwich web is passed between welding electrodes 26, 28 which form the lines of sealing 15, 16 illustrated in FIG. 1.

The electrodes 28 are bar electrodes which extend transverse to the direction of the length of the yarns and there are a number of such electrodes 28 so as to produce a number of shade cards simultaneously at one operation of the electrodes 26, 28. Electrode 26 is a platen which is common in that it co-operates with each electrode 28.

The electrodes 26, 28 are pressed together and a high frequency welding current is passed therethrough so that the plastic of the sheets of rolls 18, 20 melts along the lines defined by the electrodes 28 and fuses into the wool yarns so that the plastics sheets and the yarns become sealed together.

After a number of shade cards are thus formed the sandwich web is pulled out from between the electrodes 26, 28 so that a fresh stretch of sandwich web is pulled therebetween ready for the preparation of another set of cards. The formed cards are joined edge to

edge at this stage and form the composite sheet 30 which passes out of the end of the apparatus.

The sheet 30 is eventually cut into strips forming the individual cards by cutting parallel and close to each transverse line 15 of sealing and then half of the transparent front sheet of each card is removed by cutting or other means to form cards similar to that described with reference to FIG. 1.

The only difference between the embodiment of FIGS. 3 and 4 from that of FIGS. 1 and 2 is that in the embodiment of FIGS. 3 and 4 the front plastics sheet 12 is omitted and only a single transverse line of welding 32 corresponding to line 16 in FIG. 1 is necessary for each card (see FIG. 3). Thus, the same reference numerals as have been used in FIGS. 1 and 2, as far as applicable, have been in FIGS. 3 and 4.

In this latter embodiment the thermoplastic material of the backing sheet 10 fuses into the yarns 14 and is allowed to act so that the yarns become firmly adhered to the backing sheet. In the final sheet 30 therefore there are a number of parallel lines of sealing 32 extending transversely of the sheet and spaced apart by equal amounts. To produce the individual cards, the sheet 30 is cut into strips transversely by any suitable means and at appropriate places.

With the method according to the invention, shade cards can be produced quickly and easily and as in each case all of the tuft is exposed to view, the cards can be made of less width than the known cards and therefore are cheaper to make than the known cards.

Also, in the cards made according to each embodiment, at least part of all the tufts is uncovered and is unimpaired by the adhesion process and is left free to be handled for judging the feel of the yarn and to be matched or differentiated by colour, texture, bulk or other quality.

Modifications may be made without departing from the scope of the invention as defined by the appended claims. Thus, for example, the melting or fusing of the thermoplastic material may alternatively be achieved by use of dielectric, ultrasonic or any other suitable form of heating. Also, separate sheets of synthetic plastics material could be used instead of drawing long lengths off rolls.

It will be seen that this invention provides fibrous yarn shade cards presenting important advantages over those previously produced or proposed; namely, the assurance that no colour change will occur as a result of the bonding or adhesion, that the texture of the major portion of the yarn tufts is unimpaired despite the bonding or adhesion operation, and that the actual comparison between the yarn tuft samples and the eventual product of this yarn, e.g. a tufted rug, pile velvet fabric or other article or material will be authentic because the yarn has not been mechanically or chemically altered as would be the case where the tufts are secured on the cards by application of adhesive and pressure over their entire lengths.

We claim:

1. The method of making a plurality of identical yarn shade cards each card providing an array of colored yarns adhered to a backing sheet comprising:

a. placing a number of individual fibrous yarns in side-by-side array parallel to one another across and on a backing sheet which is composed of synthetic thermoplastic material which becomes adhesive in response to heat;

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b. applying heat and pressure simultaneously along a plurality of spaced apart, parallel bonding lines which extend the length of said sheet, said bonding lines extending transversely to said array of yarns and across the same, the heat melting the thermoplastic material to fuse into and to anchor the fibers of the yarn along each said line to the backing sheet;

c. thereafter cooling the shade card so that the

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melted thermoplastic material sets along said bonding lines to thereby form a plurality of arrays of yarns bonded along said lines and fused onto said backing sheet; and,

d. cutting one yarn shade card from said plurality along a line which is parallel to said bonding lines and thereby produce a plurality of separated shade cards.

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