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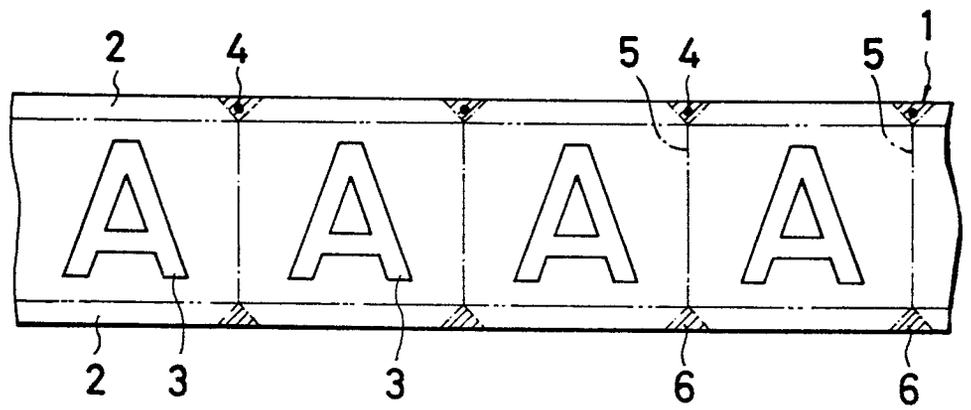
(54) Method of severing an elongate tape.

(57) A method of severing an elongate tape (I), such as a surface fastener tape, into pieces comprises: providing a plurality of register marks (4) on the elongate tape (I) one at a position between each adjacent pair of ornaments (3); feeding the elongate tape (I) to a cutting station; sensing the foremost register mark (4) to stop the feeding of the elongate tape (I) when the foremost register mark (4) arrives at the cutting station; and severing the elongate tape (I) transversely at the foremost register mark (4) so as to remove the latter from the elongate tape (I) and a prospective tape piece.

FIG. 2



EP 0 227 307 A2

METHOD OF SEVERING AN ELONGATE TAPE

The present invention relates to a method of severing an elongate tape, which bears on its one surface a plurality of ornaments such as designs, symbols, characters and emblems at predetermined distances, into pieces such that each ornament is disposed centrally on the respective piece.

Elongate tapes such as surface fastener tapes are usually made by weaving or knitting and are hence extendible. Because of this extendibility, even through a plurality of ornaments such as designs, symbols, characters or emblems are dyed or printed on one surface of the elongate tape at regular distances, the distances between the ornaments would be staggered as the elongate tape is tensioned during the severing, thus resulting in improperly severed tape pieces in which some ornaments are not centrally disposed on the individual pieces, some of which are cut across the ornaments.

One solution has been proposed by Japanese Patent Publication No. 60-53317, in which a plurality of register marks are made on the elongate tape at predetermined distances between adjacent ornaments and then the elongate tape is cut transversely at the register marks. A problem with this prior art is that the register marks remain on the resulting tape pieces, making the latter unpleasant in appearance and hence not suitable for attachment to a garment.

The present invention seeks to provide a method of severing an elongate tape into pieces of desired lengths easily and precisely without any register marks remaining on the tape pieces.

According to the present invention, there is provided a method of severing an elongate tape into pieces, comprising the steps of: providing a plurality of ornaments, such as designs, symbols or characters, on one surface of the elongate tape at predetermined distances and also providing a plurality of register marks on one surface of the elongate tape one at a position between each adjacent pair of the ornaments; feeding the resultant elongate tape longitudinally to a cutting station; sensing a leading one of the register marks and, in response to said sensing, stopping said feeding of the resultant elongate tape when said leading register mark arrives at the cutting station; and severing the resultant elongate tape transversly at said leading register mark so as to remove the latter from the elongate tape and a prospective tape piece.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed discription and the accompanying drawings in which certain preferred embodiments incorporating the principles of the present invention are shown by way of illustrative example.

Figure I is a fragmental plan view of an elongate tape with a plurality of register marks in the form of dots provided on and along one longitudinal margin thereof;

Figure 2 is a view similar to Figure I, illustrating the manner in which the elongate tape of Figure I is severed according to the present invention;

Figure 3 is a fragmentary plan view of an elongate tape with a plurality of register marks in the form of transverse lines provided on one surface thereof;

Figure 4 is a view similar to Figure 3, illustrating the manner in which the elongate tape of Figure 3 is severed according to the present invention; and

Figure 5 is a fragmentary plan view of an elongate tape, illustrating a prior art problem.

Figure I shows an elongate surface fastener tape I having on one surface a multiplicity of male or female locking elements (not shown). The elongate surface fastener tape I has a pair of element-free margins 2,2 extending along opposite longitudinal tape edges and devoid of locking elements. A plurality of ornaments 3, such as designs, symbols or characters, are provided, for example by dyeing or printing, on one surface of the elongate surface fastener tape I at predetermined distances thereabout.

The elongate surface fastener tape I also has a plurality of register marks 4 in the form of dots provided on and along at least one of the element-free margins 2 in such a manner that each register mark 4 is disposed between each adjacent pair of the ornaments 3,3.

For severing the resultant elongate surface fastener tape I precisely at a position between the foremost adjacent pair of the ornaments 3,3 the elongate surface fastener tape I is fed longitudinally to a cutting station, during which time a leading one of the register marks 4 is sensed optically by means of a suitable sensor, such as a transmission-type sensor, a reflection-type sensor or a color sensor. In response to this sensing, the feeding of the elongate surface fastener tape I is stopped when the foremost register mark 4 arrives at the cutting station so as to be vertically aligned with a cutter (not shown) extending transversely over the elongate tape I.

With the foremost register mark 4 disposed in vertical alignment with the non-illustrated cutter, the cutter is lowered to sever the elongate surface fastener tape I transversely at the foremost register mark 4 in such a manner that the latter is cut off from the elongate tape I and a prospective tape piece. This severing or cutting is accomplished by a generally r-shaped or double-C-shaped (a pair of Cs confronting each other) cutter blade. As a result, a tape piece has been severed from the elongate surface fastener tape I on which tape piece the foremost ornament 3 is disposed centrally.

As the foregoing procedures or steps are repeated in sequence, the elongate surface fastener tape I is severed into pieces one by one precisely at the register marks 4. Designated by the numeral 5 in Figure 2 are cutting lines along which the elongate tape I is to be severed. Designated by the numeral 6 in Figure 2 are corner portions which are to be cut off.

Figure 3 shows another elongate surface fastener tape I which is similar to the elongate tape I of Figure I except in that a plurality of register marks 7 are in the form of straight lines each disposed between each adjacent pair of the ornaments 3,3 and extending transversely across the elongate tape I. In order to sever the elongate surface fastener tape I of Figure 3 into pieces, a plurality of border portions 8 each including a respective register mark 7 extending centrally thereof are cut off, as shown in Figure 4.

In the foregoing embodiments, the register marks 4, 7 may be provided on the rear surface of the elongate surface fastener tape I. According to the present method, it is possible to sever the elongate tape I into pieces such that each piece includes more than one ornament 3. Further, the present method may be applied to the severing of an elongate tape other than a surface fastener tape.

According to the present method, since a plurality of register marks are provided on the elongate tape each at a position between each adjacent pair of ornaments, it is possible to sever the elongate tape easily and precisely at positions between adjacent ornaments even if the distances between the ornaments were staggered as the elongate tape was tensioned during the severing. Further, since each register mark is removed from the elongate tape and a prospective tape piece during the severing or the elongate tape, by removal of a tape portion containing the mark, it is possible to obtain individual tape pieces each free from any part of the register mark and hence neat in appearance.

Claims

I. A method of severing an elongate tape (I) into pieces, comprising the steps of: providing a plurality of ornaments (3), such as designs, symbols or characters, on one surface of the elongate tape (I) at predetermined distances and also providing a plurality of register marks (4), (7) on one surface of the elongate tape (I) one at a position between each adjacent pair of the ornaments (3); feeding the resultant elongate tape (I) longitudinally to a cutting station; sensing a leading one of the register marks (4), (7) and, in response to said sensing, stopping said feeding of the resultant elongate tape (I) when said leading register mark - (4), (7) arrives at the cutting station; and severing the resultant elongate tape (I) transversly at said leading register mark (4), (7) so as to remove the latter from the elongate tape (I) and a prospective tape piece.

2. A method according to claim I, said register marks (4) being in the form of dots disposed on and along at least one of opposite margins (2) of the elongate tape (I).

3. A method according to claim I, said register marks (7) being in the form of straight lines each extending transversely across the elongate tape (I).

FIG. 1

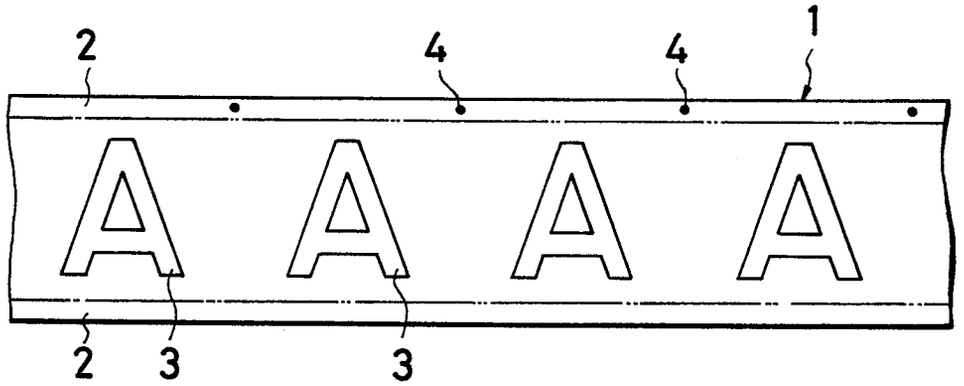


FIG. 2

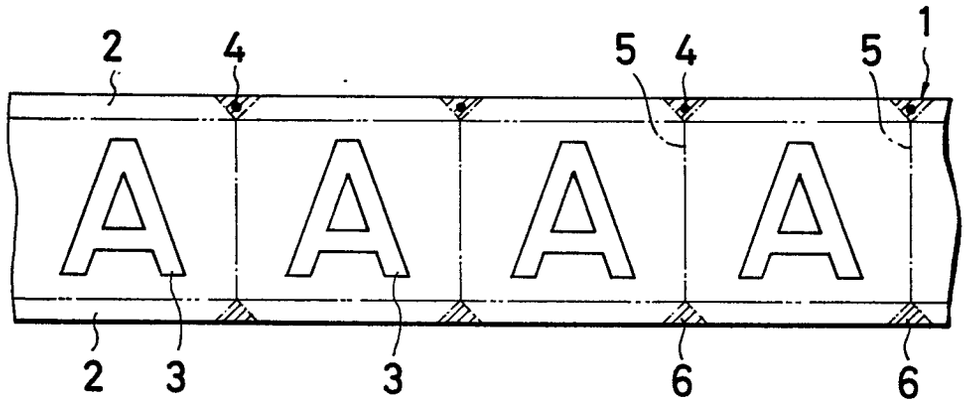


FIG. 3

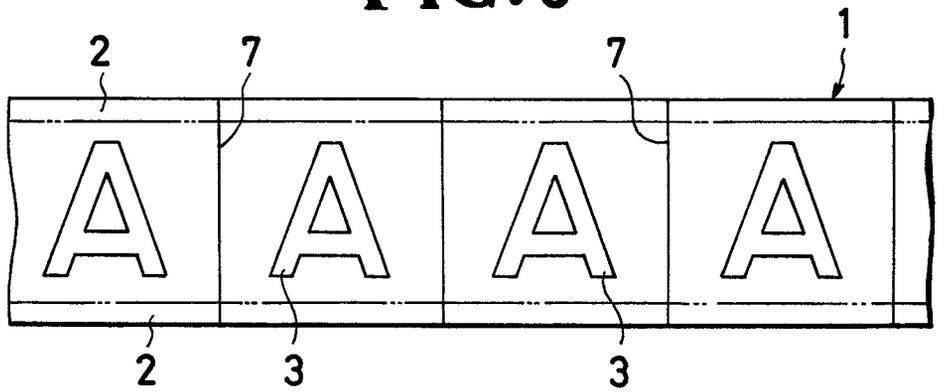


FIG.4

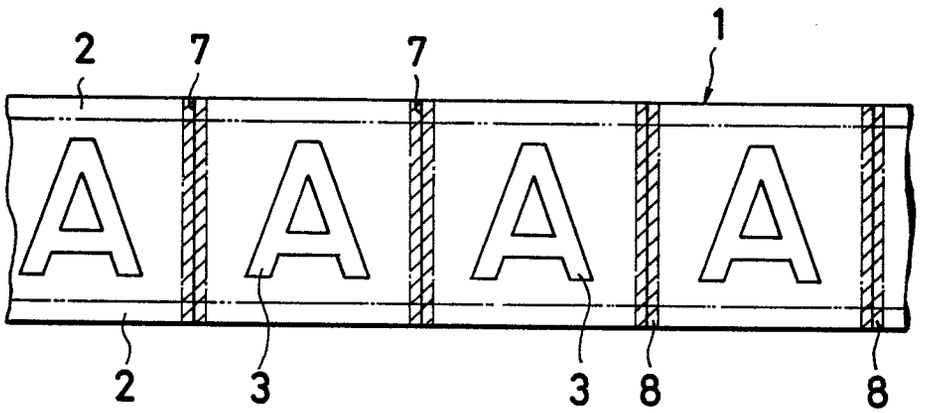


FIG.5
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