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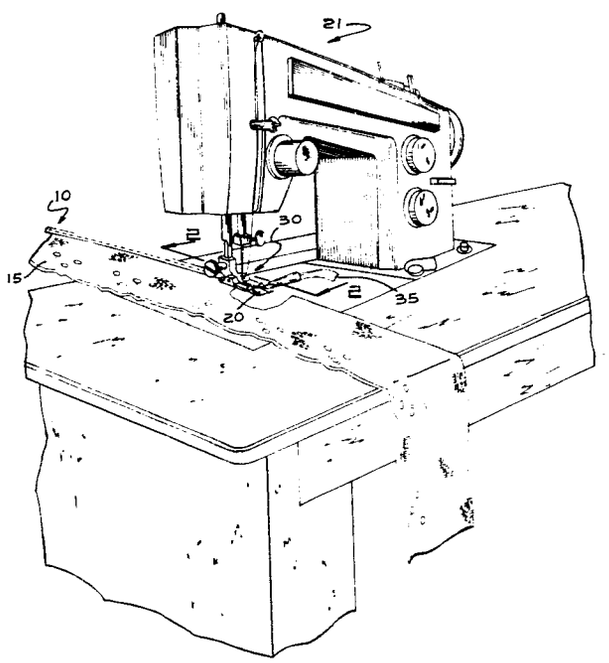
(54) Iron-on product and method of manufacturing same.

(57) A method of manufacturing an iron-on textile product by assembling a textile web (15), a fabric binding or header tape (35) by folding the same about the unfinished edge of the web (15) and a discrete flexible ribbon (20) of heat responsive adhesive disposed on the outer surface of the header and simultaneously uniting the three components by stitching them in assembled relation. The textile product such as garments or textile household articles produced by this method.



EP 0 003 681 A1

IRON-ON PRODUCT AND METHOD OF MANUFACTURING SAME

BACKGROUND

Iron-on textile products usually comprise fabric patches, or narrow tapes coated on one side with an adhesive layer. The products are used for repairing, decorating or finishing garments and other household articles such as curtains and table cloths and include such diverse products as iron-on garment patches, seam bindings, trimmings, zippers and the like. The adhesive is usually doctored into the textile fabric as a liquid coating or layer. Another method involves an extrusion technique by which a bead of adhesive in softened condition is applied to a textile web and adhered thereto. With these adhesive application processes, accurate control of the processing parameters is required to achieve a strong bond between the adhesive and the textile substrate. For example, if the adhesive is applied at too high a temperature, it will penetrate or "strike through" the fabric, particularly where the fabric is sheer or has a loose or open weave. Such adhesive "strike through" not only results in an unsightly product appearance, but may also prove unsuitable for iron-on application because of the tendency of the adhesive to flow through the fabric and adhere to the pressing iron being used by the consumer for application of the product. On the other hand, if the adhesive applied to the textile substrate is at too low a temperature it exhibits a marked tendency to be weakly bonded to the substrate whereby it may curl at the edges or even prematurely separate from the supporting fabric. Accordingly, it will be appreciated that such prior methods of adhesive application require quite critical control of the operating parameters and are not desirable for all iron-on products, particularly not where sheer or open weave fabrics are called for.

It is the principal object of this invention to provide an improved iron-on product and method of manufacturing the same which overcomes the deficiencies of the prior art.

It is another object of this invention to provide an improved method of manufacturing an iron-on textile product in which the fabrication of the product and the application of the iron-on adhesive are simultaneously accomplished in a single operative step.

It is a further object of this invention to provide an improved iron-on textile product in which the problems of adhesive strike through and weak or incomplete adhesive bonding are overcome.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects of this invention will be more readily apparent from the description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view illustrative of the method of the present invention;

Fig. 2 is a partial elavational view on an enlarged scale taken in the direction of line 2-2 of Fig. 1;

Fig. 3 is a perspective view showing an iron-on textile product embodying the invention;

Fig. 4 is an enlarged view taken in the direction of line 4-4 of Fig. 3;

Fig. 5 is a top plan view of the method and apparatus illustrated in Fig. 1; and

Fig. 6 is an elevational view taken in the direction of line 6-6 of Fig. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While the present invention is useful for fabricating any of the various types of iron-on textile articles currently available, it is particularly advantageous in making decorative rufflings or lace trimming 10. As shown, a lace trimming 10 consists of a lace fabric web 15 with a binding tape or header 35 folded over the cut or unfinished edge of the web 15 and stitched thereto by a line of stitches 25, Fig. 3. In accordance with the present invention a flexible ribbon, band or strip 20 of heat responsive or fusible adhesive is affixed along the edge portion of the trimming, as best shown in Figs. 3 and 4. The adhesive ribbon 20 is disposed on the undersurface of the header or tape 35. At room temperature the adhesive ribbon 20 which may be formed of a polyamide resin is a form stable, non-tacky adhesive which is held in place on the textile trimming by the same line of stitches 25 by which the header 35 is attached.

The iron-on product 10 embodying this invention may be applied to any desired fabric article, such as garments or household articles including bed spreads, curtains or table cloths. The article 10 is applied in the same manner as conventional iron-on products. In this regard, it is customary to use an electric pressing iron set to a selected temperature in the range of 300 - 420° F which is above the softening point of the polyamide adhesive. The iron-on product is placed with its adhesive side against a textile article to which it is to be bonded and heat and pressure are applied using a pressing iron against the outer surface of the trimming. As a result the adhesive ribbon 20 will be softened sufficiently so that the adhesive will penetrate partially into the fabric adjacent plies consisting of iron-on articles per se and the article to which the trimming is being applied. Upon removal of heat, the adhesive will promptly solidify and set or form a secure mechanical bond linking together the trim or finding and the selected garment or household article.

In accordance with this invention, the iron-on product illustrated in Figs. 3 and 4 is fabricated by a sewing operation wherein the multiple components of the product, including the fabric web 15, the header 35 and the adhesive ribbon 20 are assembled and simultaneously united by a line of stitches applied by a sewing machine 21.

The manufacture of an iron-on product in accordance with this invention may be carried out by the use of a conventional sewing machine 21 modified with appurtenances to lead into assembled relation the fabric 15, header 35 and adhesive ribbon 20. Fabric 15 is fed into sewing machine 21 beneath presser foot 45 and over reciprocable toothed drive dogs 50. The drive dog teeth grip and advance the finding through the sewing machine in a manner typical of home and industrial sewing machines.

A cutter 55 having a knife edge 60 may be provided in advance of the cutter presser foot 45, the fabric web 15 being cut to a desired width by the knife when advanced thereby. Of course, if the method of the present invention were practiced with a pre-trimmed finding, provision for a knife would not be required.

For imparting a finished look to the product a binding tape or header 35 is longitudinally folded about the cut or unfinished inner edge of the fabric web 15. The header comprises a fabric tape which is folded in half by a folding guide 65 (Figs. 5 and 6). The guide comprises an open ended tubular member of tapered cross section diminishing from its inlet to its outlet end. The outlet end of the folding guide has a V-shaped notch 75 disposed in line with the feed dogs 50 of the sewing machine 21. The header material 35 is advanced by the feed dogs through the folding guide and the sewing machine. As the header moves through the guide 65, its converging inner wall configuration causes the tape 35 to be folded on itself or doubled over in a longitudinal

direction. The edges 77 of the folded tape face toward the same direction as that from which the textile web 15 is being supplied. The leading edge of the web 15 is led into notch 75 of the folding guide where it is fitted between the plies of the header.

The web 15 and the assembled header are then led along a path under the presser foot 45 which holds the plies during the stitching operation by the sewing machine 21. The fabric web 15 and the header are advanced past the sewing machine needle 105 by the drive dogs 50. At a point intermediate the stitching operation and the folding of the header about the inner edge of the web 15, adhesive ribbon 20 is led to intersect the path of movement of the trimming and into contact with the underside of the header 35 as best shown in Fig. 2. The leading edge of the adhesive ribbon 20 is placed against the underside of the header and the three components are fed through the sewing machine where they are simultaneously sewn together in assembled relation resulting in an article of manufacture such as shown in Figs. 3 and 4. To assure proper location of the adhesive ribbon with respect of the fabric components of the iron-on product, the ribbon is led through a tubular guide 80, Fig. 6 and its outlet end is disposed so that the ribbon will intersect the path of movement of fabric components adjacent the sewing machine feed dogs 50. The tubular guide 80 is clamped between a pair of oppositely recessed blocks 85 adapted to clampingly retain the guide 80 therebetween. The blocks permit longitudinal adjustment of the guide 80 so that its outlet end may be accurately positioned relative to the feed dogs of the sewing machine 21. Blocks 85 are in turn supported by an arm 90 and are rotatably adjustable with respect thereto whereby the location of the outlet end of the guide 80 may be adjusted laterally as well as longitudinally. Arm 90 is carried on a rod 95 and is longitudinally adjustable on the rod to allow fine adjustments in the longitudinal location of the outlet guide.

A sensor 100 is located in advance of the inlet end of the tube 80 and the adhesive strip 20 is moved through this sensor which monitors the condition of the strip for the purpose of detecting any break or discontinuity in the strip. The monitor is connected to a switch or alarm device which is adapted to either cut off the sewing machine or sound an alarm to alert an operator in response to a signal from the monitor. In this way, if there is any discontinuity or break in the adhesive, the sewing operation will be stopped and the deficiency corrected so as not to result in a defective product.

In operation, once the header tape has been folded about the inner edge of the fabric 15 and the adhesive ribbon has been inserted between the header and the drive dogs 50 of the sewing machine, normal operation of the machine results in the drive dogs 50 continuously drawing the assembled parts into an integral uniform iron-on product or article of manufacture and the adhesive ribbon 20 is held in place on the article by the same line of stitches 25 which fasten the header to the textile web 15. The heat responsive adhesive selected is such that at normal temperatures the ribbon 20 is non-tacky and form stable having essentially unlimited shelf life so long as not subjected to extremely high temperatures. By the process embodying this invention, therefore, the assembly of the components of the iron-on product and the fastening of the products into a unified structure are carried out continuously and simultaneously, whereby the adhesive is applied at the same time as the binding or header is sewn onto the textile web 15. In this way, no additional product handling or processing is required other than those steps normally used in the fabrication of the comparable textile article lacking the iron-on feature.

CLAIMS:-

1. Method of manufacturing an iron-on textile product comprising the steps of advancing a textile web along a given path, intersecting said path with a heat fusible, flexible adhesive ribbon and disposing said ribbon against the surface of said web and continuously stitching such ribbon onto said web.

2. Method of manufacturing an iron-on textile product as set forth in Claim 1 wherein the path of said advancing web is intersected along one edge by a header tape and thereafter by said adhesive ribbon, folding said header about a longitudinal edge of said web and disposing said ribbon along an outer surface of said header and simultaneously stitching together said web, header and adhesive.

3. Method of manufacturing an iron-on textile product as set forth in Claim 2 wherein said stitching is effected by a sewing machine having a reciprocating sewing needle, and including reciprocating feed dogs for advancing said web carrying the header and ribbon past the needle of said machine.

4. Method of manufacturing an iron-on textile product as set forth in Claim 3 wherein said header is folded about the inner edge of said web by a folding guide disposed at an angle to said inner edge of said web and said adhesive ribbon is led through a guide directed toward the path of movement of said web and whose outlet end is disposed in a plane which intersects said path.

5. The method of Claim 4 wherein said header is folded by being drawn through a tubular guide having converging inner walls and wherein said adhesive ribbon guide has its outlet end directed toward the underside of said header at a point in advance of said sewing machine feed dogs and reciprocating needle.

6. The method of Claim 5 wherein the continuity of said adhesive irbbon is continuously monitored to enable stopping of the sewing machine in the event of a discontinuity in said ribbon.

7. An improved iron-on product comprising a fabric web and a discrete ribbon of heat fusible form stable, non-tacky adhesive stitched onto one side of said web.

8. The iron-on product of Claim 7 wherein said web along one longitudinal edge thereof includes a header in the form of a fabric tape folded about said longitudinal edge, the stitches by which said adhesive ribbon is held in place also serving to affix said header onto the fabric web.

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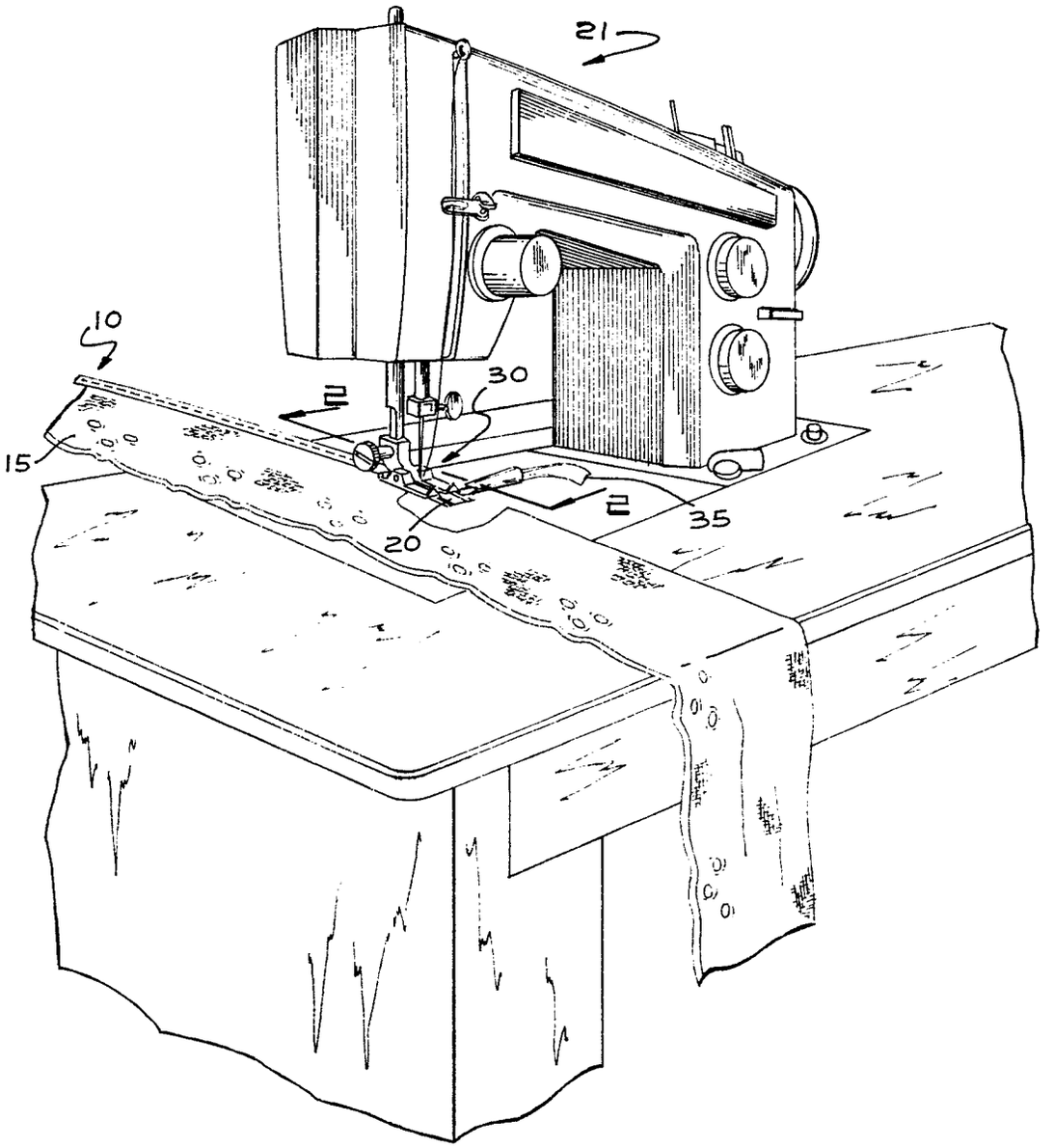
Fig. 1.



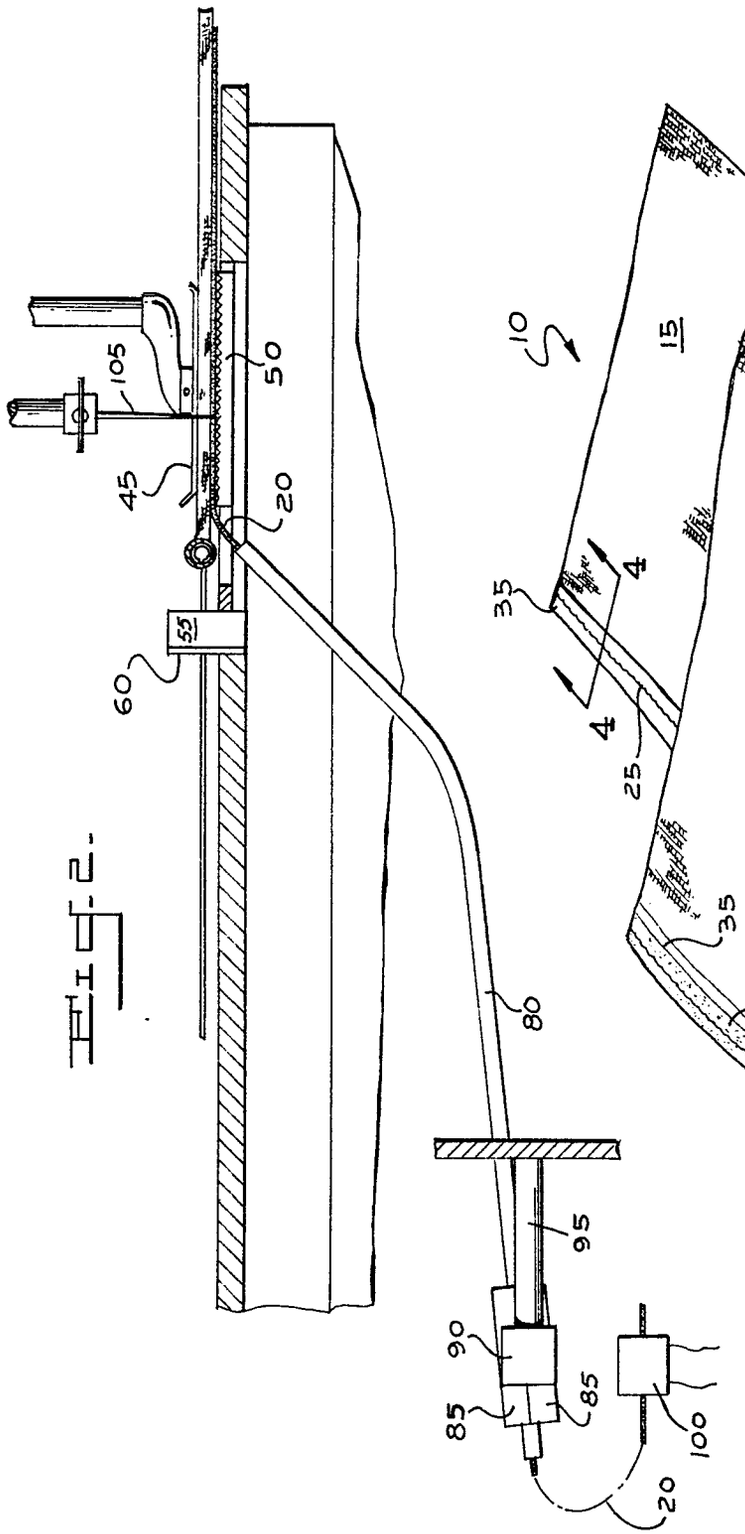


FIG. 2.

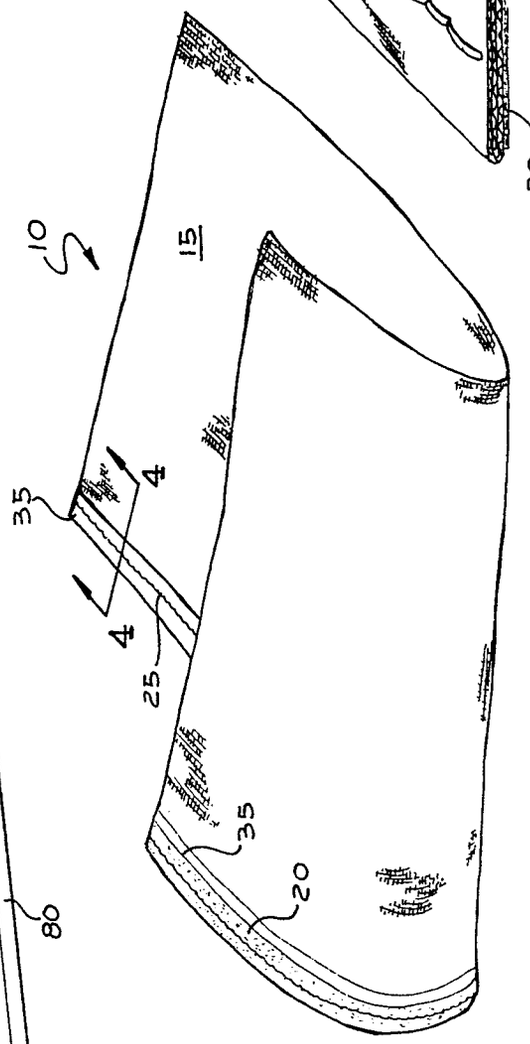


FIG. 3.

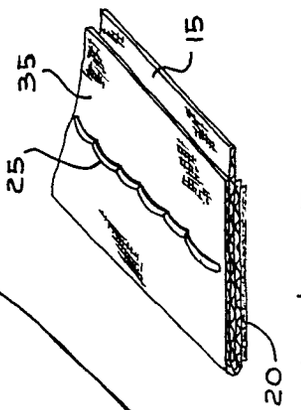


FIG. 4.

FIG. 5.

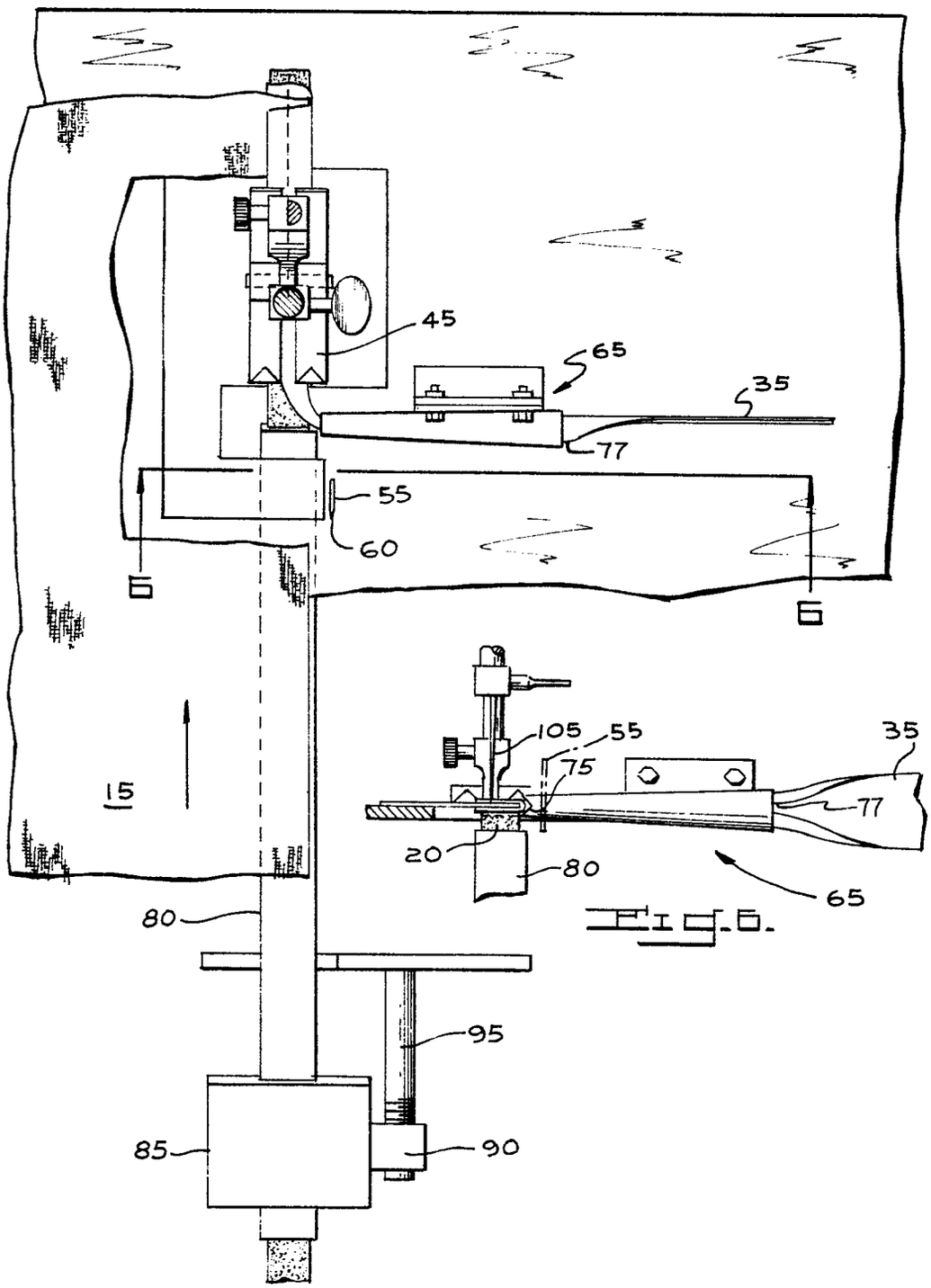


FIG. 6.

European Patent Office

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EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	GB - A - 793 703 (BROUGHTON) * Page 1, column 1, paragraph 4 *	1
	FR - A - 1 230 168 (LEGENDRE) * Page 1, column 2, paragraphs 6 and 7 *	1
	US - A - 2 274 721 (MARINSKY) * Page 2, column 2, lines 56-59 *	6
	US - A - 2 060 288 (DONOVAN) * Page 1, column 1, lines 49-53; column 2, lines 24-29; page 2, column 2, lines 25-37 *	1

CLASSIFICATION OF THE APPLICATION (Int. Cl.²)

A 47 H 13/16

TECHNICAL FIELDS SEARCHED (Int.Cl.²)

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A 47 H 13/16

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23-04-1979	VUILLEMIN