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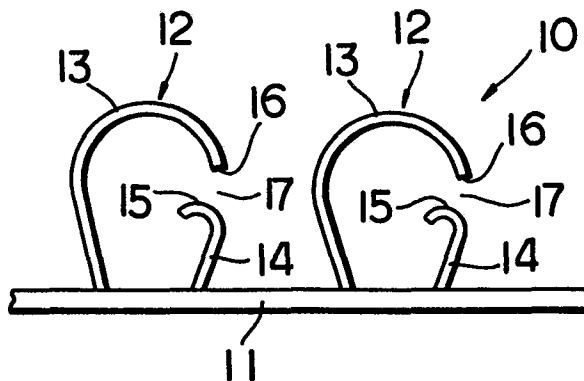
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㉙ **Hooked fabric fastener tape.**

㉚ A hooked fabric fastener tape (10) has on one surface of a foundation structure (11) a number of material engaging means (12) each comprising a pair of hooks (13, 14) which have been made by cutting one loop of synthetic resin thread woven into the foundation structure. One of the hooks (13) is larger in height than the other hook (14) so as to provide a large opening (17) between the respective end portions (16, 15) thereof for easy reception of cooperating loops of mating looped fabric fastener tape. The hooks (13, 14) of different height are reliably engageable with any of the cooperating loops fanned apart on the looped fabric fastener tape.



HOOKED FABRIC FASTENER TAPE

The present invention relates generally to surface type fasteners known as hook-and-loop fasteners, and more particularly to a fabric fastener tape carrying on its one surface a number of improved hook-shaped material engaging means.

According to a known method, a hooked fabric fastener tape of the type described has on one of opposite surfaces of a foundation structure a number of hook-shaped material engaging elements and stems which have been produced in pair by cutting loops on the respective one leg sections thereof, the loops being made of synthetic resin monofilaments woven into the foundation structure and raising from said one surface thereof. The prior art hooked fabric fastener tape is disadvantageous in that the stems have their respective free ends disposed adjacent to and substantially confronting relation to the free ends of the corresponding hook-shaped material engaging elements. Such stems have no function to hook the cooperating loops on a mating looped fabric fastener tape, or rather hinder the loops from being introduced into hooking engagement with the hook-shaped material engaging elements as the two fasteners tapes are pressed into face-to-face contact together. As a result, the possibility of hooking between hooks and loops, i.e., the firmness of engagement of a hook-and-loop fastener decreases considerably.

According to the invention, there is provided a hooked fabric fastener tape including a foundation structure and a number of material engaging means projecting from one surface of the foundation structure and each made by cutting one loop of synthetic resin thread woven into the foundation structure, each of the loops including a pair of leg sections and a head section interconnecting the leg sections. Each of material engaging means comprises a pair of hooks, one of said hooks being larger in height than the other hook.

The present invention seeks to provide a hooked fabric fastener tape for hook-and-loop fasteners which can adhere to or engage with a mating looped fabric fastener tape with an increased degree of firmness.

The invention also seeks to provide a hooked fabric fastener tape having hook-shaped material engaging means which can hook cooperating loops of a mating looped fabric fastener tape reliably without causing mis-engagement therewith.

5 The invention further seeks to provide a hooked fabric fastener tape having improved hooks reliably engageable with any cooperating loops fanned apart on a mating looped fabric fastener tape.

 The above and other objects, advantages and features
10 of the present invention will become apparent from the following purely illustrative and not limitative description of preferred embodiments taken in conjunction with the accompanying drawings, in which :

 Figure 1 is a fragmentary diagrammatic side eleva-
15 tional view of a hooked fabric fastener tape according to the present invention ; and

 Figure 2 is a view similar to Figure 1, showing a modified hooked fabric fastener tape of the present invention which is brought into hooking engagement with a mating looped
20 fabric fastener tape.

 Referring now to the drawing, and more particularly to Figure 1, there is shown a hooked fabric fastener tape 10 constructed in accordance with the present invention. The hooked fabric fastener tape 10 includes a foundation structure
25 11 and a number of material engaging means 12 projecting from one surface of the foundation structure 11. The foundation structure 11 is constituted by weaving together a weft thread and a plurality of warp threads in a well-known manner. Each of the material engaging means 12 comprises a pair of hooks 13, 14
30 which have been made by cutting one loop of synthetic resin thread woven, as a plurality of auxially warp threads, into the foundation structure 11 as the latter is woven, each loop including a pair of leg sections and a head section interconnecting the leg sections. The loops, hence the hooks 13, 14
35 are preferably made of thermoplastic monofilaments.

 One of the hooks 13 of each material engaging means 12 is larger in height than the other hook 14. The one or large hook 13 is formed jointly with one of the leg sections, the head section and a portion of the other leg section which

has been cut whereas the other or small hook 14 is formed with the remainder of the other or cut leg section, the free end of the remainder leg being curved to form a locking end portion 15. The locking end portion 15 of the small hook 14 curved toward the large hook 13 and directed to one of the surfaces of the foundation structure 11, thereby providing between the locking end portion 15 and the free end 16 of the large hook 13 a large opening 17 for easy reception of cooperating loops 18a, 18b of a mating fabric fastener tape 19 shown by phantom lines in Figure 2. Although such small hooks 14 as illustrated are very advantageous to give the hooked fabric fastener a maximum number of hooks per unit area, they may have their respective locking end portions curved into any directions with respect to the corresponding large hooks 13.

Figure 2 shows a modified hooked fabric fastener tape 20 having material engaging means 21 each comprising a pair of hooks 22, 23 projecting from one surface of a foundation structure 24, one of the hooks 22 being larger in height than the other hook 23. The small hooks 23 are the same as the small hooks 14 shown in Figure 1, but the large hooks 22 are different from the aforesaid large hooks 13 in that their respective free ends or locking end portions 25 are curled so as to hold more securely the cooperating loops 18a, 18b in hooking engagement therewith against force tending to separate the fabric fastener tapes 19, 20. Provided between the locking end portion 25 and a locking end portion 26 of small hook 23 is an opening 27 larger than the opening 17 shown in Figure 1, the opening 27 allowing the cooperating loops 18a, 18b of the looped fabric fastener tape 19 to enter more smoothly into hooking engagement with the hooks 22, 23 as the two fastener tapes 19, 20 are pressed together.

As best shown in Figure 2, the hooked fabric fastener tape 20 (10) of the invention can adhere to or engage with the mating looped fabric fastener 19 with an increased degree of firmness through the hooking engagement between, on one hand, the large hooks 13 (22) and recumbent ones 18a of fanned-apart loops 18a, 18b and, the other hand, the small hooks 14 (23) and relatively upstanding loops 18b.

CLAIMS

1. A hooked fabric fastener tape (10 ; 20) including a foundation structure (11 ; 24) and a number of material engaging means (12 ; 21) projecting from one surface of the foundation structure (11 ; 24) and each made by cutting one loop of
5 synthetic resin thread woven into the foundation structure (11 ; 24), each of the loops including a pair of leg sections and a head section interconnecting the leg sections, characterized in that each of the material engaging means (12 ; 21) comprises a pair of hooks (13, 14 ; 22, 23), one (13 ; 22) of
10 said hooks being larger in height than the other hook (14 ; 23).

2. A hooked fabric fastener tape according to claim 1, characterized in that said larger hook (13 ; 22) is formed jointly with one of said leg sections, said head section and a part of the other leg sections, said other hook (14 ; 23) being
15 formed with the remainder of said other leg section.

3. A hooked fabric fastener tape according to claims 1 or 2, characterized in that said other hook (14 ; 23) has a locking end portion (15 ; 26) curved toward said larger hook (13 ; 22) and directed to said surface of said foundation
20 structure (11 ; 24).

4. A hooked fabric fastener tape according to any preceding claim, characterized in that said larger hook (22) has a curled locking end portion (25).

5. A hooked fabric fastener tape according to any
25 preceding claim, characterized in that said hooks (13, 14 ; 22, 23) are formed with thermoplastic monofilaments.

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FIG. 1

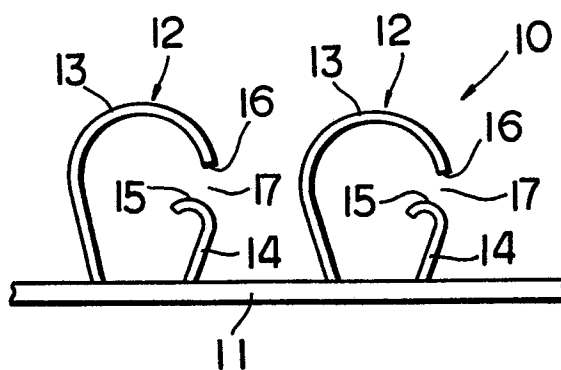
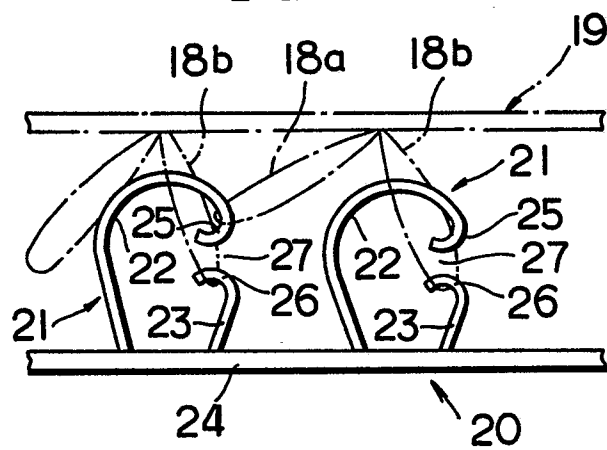


FIG. 2



0053348



European Patent
Office

EUROPEAN SEARCH REPORT

Application number
EP 81 10 9878

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	FR - A - 1 188 714 (VELCRO S.A.) * Page 3, column 2, last paragraph page 4, column 1, paragraph 1; page 5, column 1, paragraphs 4-7, column 2, paragraphs 6 and 7; page 6, column 1, paragraphs 1-6; claims g,h,i (first part) j,k,l,m; figures 12,14-18 *	1,2,3	A 44 B 18/00
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Y	GB - A - 1 299 755 (G.CH. BRUMLIK) * Page 4, lines 84-130; page 5, lines 1-18; figures 8-10	1-4	TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
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A	US - A - 2 820 277 (K. FORSTER) * Column 1, lines 14-31; column 2 lines 22-71 *	2,3,5	
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A	US - A - 3 879 835 (G.C. BRUMLIK) * Column 5, last paragraph; column 6, lines 1-53 *	2,3	
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A	US - A - 3 778 870 (MATTERN, WARE AND DAIRS) ----		CATEGORY OF CITED DOCUMENTS
			X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons
<div style="border: 1px solid black; padding: 2px;"> <div style="display: flex; justify-content: space-between;"> A The present search report has been drawn up for all claims </div> </div>			&: member of the same patent family, corresponding document
Place of search The Hague		Date of completion of the search 19-02-1982	Examiner GARNIER