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71 Applicant: Fujiwara, Hiroshi
9-3, Shinsenri-Minamimachi 3-chome
Toyonaka-shi Osaka-fu(JP)

72 Inventor: Fujiwara, Hiroshi
9-3, Shinsenri-Minamimachi 3-chome
Toyonaka-shi Osaka-fu(JP)

74 Representative: Hillier, Peter et al
Reginald W. Barker & Co., 13, Charterhouse
Square
London, EC1M 6BA(GB)

54 **Clearer for top rollers in textile machines.**

57 A clearer for top rollers (2) in a textile machine has a clearer roller (4) placed on a top roller (2) and rotated in contact with the top roller. The clearer roller (4) is constructed in taper form, whereby the surface speed of the clearer roller gradually changes from the larger diameter side to the smaller diameter side. As a result, a slip is produced between the top roller and the clearer roller depending on the difference in surface speed, which slip is utilized such that fibre waste adhering to the top roller (2) is scratched off by the clearer roller (4).

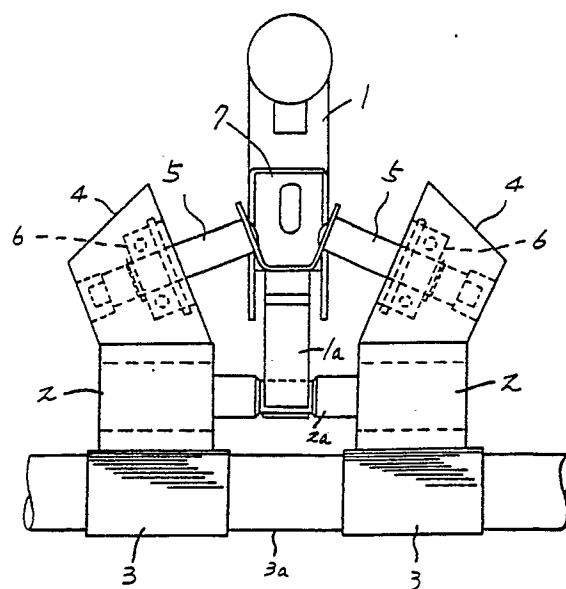


FIG. 1.

Clearer for Top Rollers in Textile Machine

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to improvements in a clearer for top rollers in a textile machine.

Description of the Prior Art

Generally, in a draft part in a spinning machine, a plurality of top rollers, such as a front top roller, a second top roller, a third top roller and a back top roller, are attached to a pressure arm and pressed against and rotated on respective bottom rollers mounted on a machine frame, so as to draft a fiber sliver. In such draft part, loose fibers twine around the front top roller; thus, in the prior art, a cylindrical clearer roller is pressed against the front top roller to remove fibers adhering to the front top roller.

In the case where a cylindrical clearer roller is used as in the prior art, since the clearer roller rotates at the same surface speed as the top roller, the cleaning effect has been low, and since fibers removed from the top roller continue to rotate as they are adhering to the clearer roller, it has been necessary to clean the clearer roller at regular intervals.

The present invention has been proposed in view of the above points concerning the prior art and has for its object the provision of a clearer for top rollers in a textile machine, designed to improve the cleaning effect of the clearer roller on the top roller and reduce the twining of fibers around the clearer roller or their adhering thereto and to positively discharge them therefrom.

SUMMARY OF THE INVENTION

To achieve the above object of the invention, a clearer roller adapted to be pressed against the upper surface of the top roller by its own weight or by external pressure is tapered.

The tapered clearer roller, which is driven against the top roller, is driven at its maximum diameter, so that in the middle region of the top roller where fibers travel (the region which requires cleaning), the surface speed of the top roller is greater than that of the clearer roller and hence cleaning is effected by frictional action.

Further, because of said difference in speed and said tapered configuration, it becomes difficult for fiber waste to adhere to the surface of the clearer and there is produced a component force which moves fiber waste to the smaller diameter end for discharge.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic front view of a draft part in a textile machine to which the present invention is applied;

Fig. 2 is a side view thereof;

Fig. 3 is a perspective view of an attaching bracket;

Fig. 4 is a front view showing another embodiment of the method of supporting clearer rollers according to the present invention;

Fig. 5 is a side view thereof;

Fig. 6 is a side view of a saddle;

Fig. 7 is a front view of the saddle;

Fig. 8 is a plan view of the saddle;

Fig. 9 is a perspective view of the saddle;

Fig. 10 is a front view of a support shaft;

Fig. 11 is a sectional view showing how a clearer roller is mounted on the support shaft;

Fig. 12 is a front view showing another embodiment of the method of supporting clearer rollers according to the invention;

Fig. 13 is a front view of another support shaft;

Fig. 14 is a plan view of a bracket;

Fig. 15 is a front view of the bracket;

Fig. 16 is a side view of the bracket;

Fig. 17 is a sectional view taken along the line I-I in Fig. 16; and

Fig. 18 is a sectional view taken along the line II-II in Fig. 16.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 is a schematic front view of a draft part in a textile machine to which the present invention is applied; Fig. 2 is a side view thereof; and Fig. 3 is a perspective view of an attaching bracket. The numeral 1 denotes a pressure arm; 2 denotes front top rollers; 3 denotes front bottom rollers; 4 denotes clearer rollers; 5 denotes support shafts; 6 denotes bearings; and 7 denotes a bracket and pressure spring assembly.

The pressure arm 1 is vertically movably sup-

ported at the rear end of a machine frame (not shown) and adapted to be locked at the lifted and lowered ends.

The front top rollers 2 are rotatably supported in bearings (not shown) at the opposite end of a shaft 2a which is supported at its middle on the front end of the pressure arm 1 through the intermediary of a holder 1a.

The pressure arm 1 also likewise supports second top rollers, third top rollers and back top rollers (not shown).

The front bottom rollers 3 are rotatably supported by the machine frame (not shown); all the front bottom rollers included in a single textile machine are formed on a common shaft 3a and are driven at a predetermined draft rate. The other bottom rollers are likewise constructed and mounted on the machine frame.

Each clearer roller 4 is substantially the same in width as the front top roller 2 and tapered and is rotatably supported on the front end of the support shaft 5 through the bearing 6. The rear ends of the support shafts 5 are fixed to the attaching bracket and pressure spring assembly 7 in such a manner that their positions can be adjusted. In addition, the width of the clearer rollers 4 is made sometimes considerably greater or sometimes less than that of the top rollers 2.

The attaching bracket and pressure spring assembly 7 is made of spring material and, as shown in Fig. 3, it comprises a pair of lateral plates 7a opposed to each other in substantially V form, and an attaching base plate 7b, said lateral plates 7a having downwardly directed elasticity and supporting the rear ends of the support shafts 5 by screwing, riveting, crimping, welding or other suitable method.

The present invention is arranged in the manner described above. The operation thereof will now be described. The front top rollers 2 are pressed against the front bottom rollers 3 through the pressure arm 1, and are frictionally rotated by the front bottom rollers 3 which are driven for rotation at a predetermined draft rate, thus applying draft to a fiber sliver (not shown).

Each clearer roller 4 is pressed against the front top roller 2 by the pressure action of the attaching bracket and pressure spring assembly 7 and is frictionally driven for rotation at its maximum diameter portion by the front top roller 2. Thereby, in the middle portion of the front top roller 2 where the fiber sliver travels, the middle portion of the clearer roller 4 is rotated at a lower surface speed than the surface speed of the front top roller 2; thus, the clearer roller 4 cleans the front top roller by frictional action due to this difference in speed.

Further, because of said difference in speed between the front top roller 2 and the clearer roller

2 and said tapered configuration of the clearer roller 4, it become difficult for fiber waste to adhere to the surface of the clearer roller 4 and there is produced a component force which moves fiber waste to the smaller diameter end for automatic discharge.

In addition, in the drawings, the larger diameter end of the clearer roller has been positioned directed inward; however, this positional relation may be reversed.

Further, in the drawings and the description given above, the clearer roller 4 has been shown as pressed against the top roller by the spring action of the attaching and pressure spring assembly 7; however, the invention is not limited thereto. For example, the clearer roller 4 may be pressed by its own weight or magnetic force.

Figs. 4 and 5 show another embodiment of the method for supporting the clearer rollers 4 according to the invention, using a single support shaft 5 for supporting the clearer rollers 4 at the opposite ends with a saddle 8 which supports the horizontal support portion 5a of the support shaft 5 in its middle, said saddle 8 being attached to the front end of the pressure arm 1 by a clearer fixing 9.

The saddle 8, as shown in Figs. 6 through 9, is formed in substantially U-shaped to hold the support portion 5a. Locking piece 8a are formed by bending at the upper end of clamp pieces 8a. When the upper ends of the clamp pieces 8a are closed by a spring clip 10, said locking pieces 8b prevent the spring clip 10 from slipping off.

Locking pawls 8c are formed at locations some distance above semi-circular portions in the lower regions of said clamp pieces 8a by cut-up operation. The locking pawls 8c each engage one of the circumferential grooves in knurled portions 5b formed in the support portion 5b, thereby preventing rotation of the support portion 5a while allowing the angle of contact of the clearer rollers 4 with the top rollers 2 to be adjusted properly.

The opposite sides of the middle portions of said clamp pieces 8a are formed with ear pieces 8d and 8e, respectively, the ear pieces 8d clamping the opposite sides of the front end of the pressure arm 1, the other ear pieces 8e clamping the clearer fixing 9. The ear pieces 8d and 8e prevent lateral movement of the saddle 8 in Fig. 4.

The clearer fixing 9 is formed of a metal plate of substantially the same width as that of the front end of the pressure arm 1 which is bent into U shape, one end thereof being fixed to the front end of the pressure arm 1, the other end being a free end whose inner surface prevents the saddle from moving toward the longitudinal front end of the pressure arm 1.

In Fig. 10, the opposite ends of the support shaft 5 are formed with external threads 5c. And,

as shown in Fig. 11, a collar 13 having an external dust preventing cap 11 and internal dust preventing washer 12 integrally fitted thereon is screwed on each external thread 5c, a bearing 6 is fitted on the collar 13 and a nut 15 is screwed on the external thread 5c through a washer 14 to fix the bearing 6 in position, the assembly being then forced into the clearer roller 4.

The clearer roller 4, as shown in Fig. 11, comprises a cup-shaped roller base member 4a and a surface lining member 4b. The roller base member 4a is made of plastic material and is internally formed with a positioning recess 4 and a slip-off preventing projection 4d disposed adjacent its opening. The surface lining member 4b is made of anti-static rubber or the like.

Fig. 12 shows an example of a supporting method used when the clearer roller 4 of the present invention is applied to a back top roller 16. Each support shaft 5 has a support portion 5d formed by vertically bending the base end, said support portion 5d being supported by the lateral surface of the pressure arm 1 through a bracket 17.

The support shaft 15, as shown in Fig. 13, has an external thread 5c in the front end thereof, and a clearer 4 constructed in the same manner as that shown in Fig. 11 is attached to said external thread.

The bracket 17, as shown in Figs. 14 through 16, comprises a top plate 17a astride the pressure arm 1, and lateral plates 17b extending downward from opposite sides of said top plate 17a, said lateral plates being partly extended downward to form rotation preventing stoppers 17c and support cylinders 17d.

The rotation preventing stoppers 17c are formed by bending the downward extensions of the lateral plates 17b on both sides into U shape as shown in Fig. 17. The support cylinders 17d are formed by bending the front ends of said U-shaped portions into semi-circles. Thus, the support shafts 5 are inserted in the support cylinders 17d, with said stoppers 17c serving to prevent rotation thereof.

The bracket 17, as shown in Fig. 5, is mounted on the pressure arm 1 and fixed thereon by bolts (not shown) by utilizing slits 17e formed in the top plate 17a.

According to the invention, it is possible to rotate the clearer roller at a speed different from that of the top roller, at the middle of the top roller where fibers travel. This difference in surface speed results in a frictional action, improving the cleaning effect on the top roller. Further, because of said difference in surface speed and said tapered configuration, it becomes difficult for fiber waste to adhere to the surface of the clearer roller and there is produced a component force which moves fiber waste to the smaller diameter end of

the clearer roller, so that it is automatically discharged; thus, there is an advantage that the time and labor for cleaning are saved.

Claims

1. A clearer for top rollers in a textile machine, characterized in that a clearer roller to be pressed against the upper surface of a top roller by its own weight or by external pressure is tapered.

2. A clearer for top rollers in a textile machine as set forth in Claim 1, characterized in that such tapered clearer rollers are rotatably mounted on a single support shaft at the opposite ends of the latter, said support shaft being supported at its middle by a pressure arm.

3. A clearer for top rollers in a textile machine as set forth in Claim 1, characterized in that tapered clearer rollers on opposite sides of a pressure arm are supported on independent support shafts.

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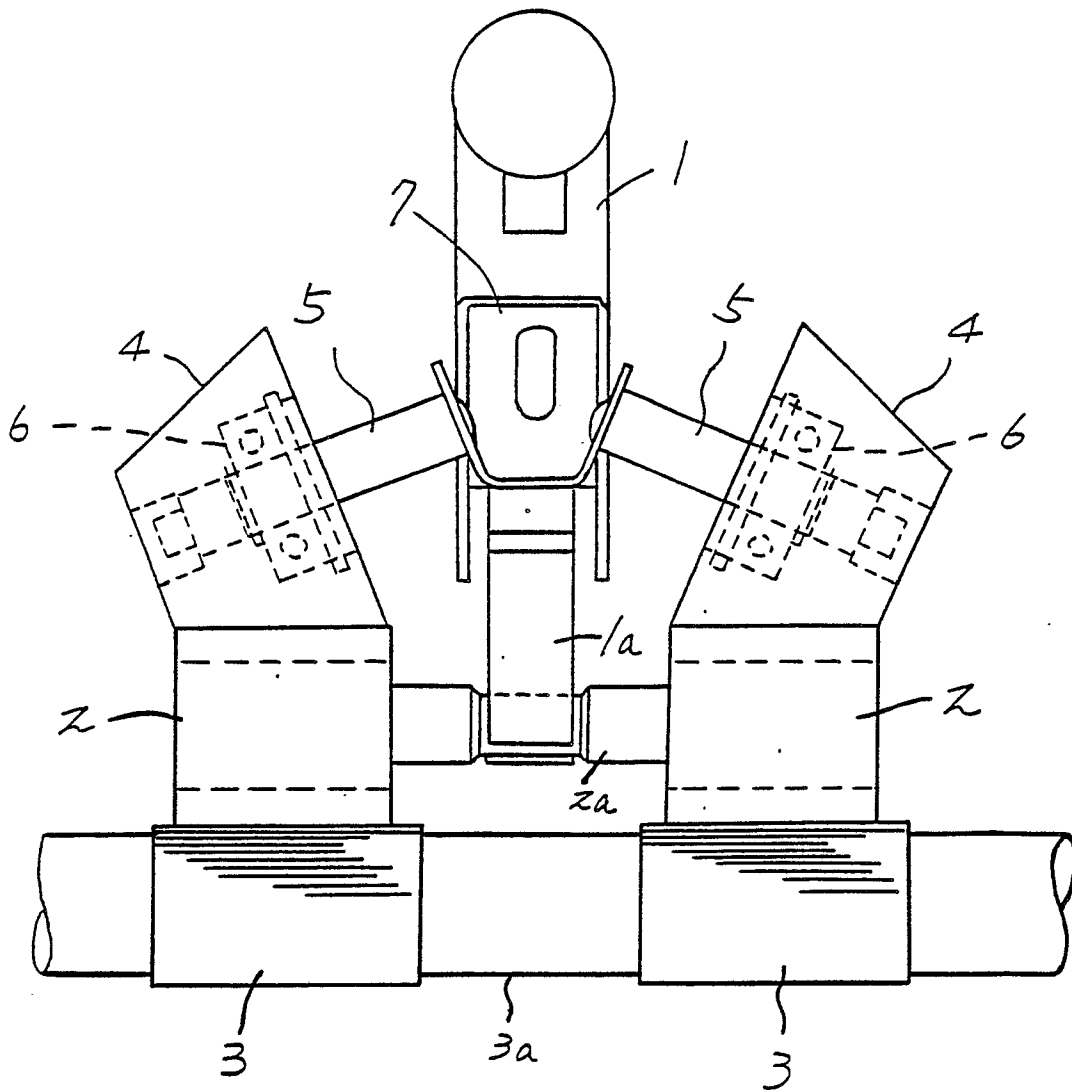


FIG. 1.

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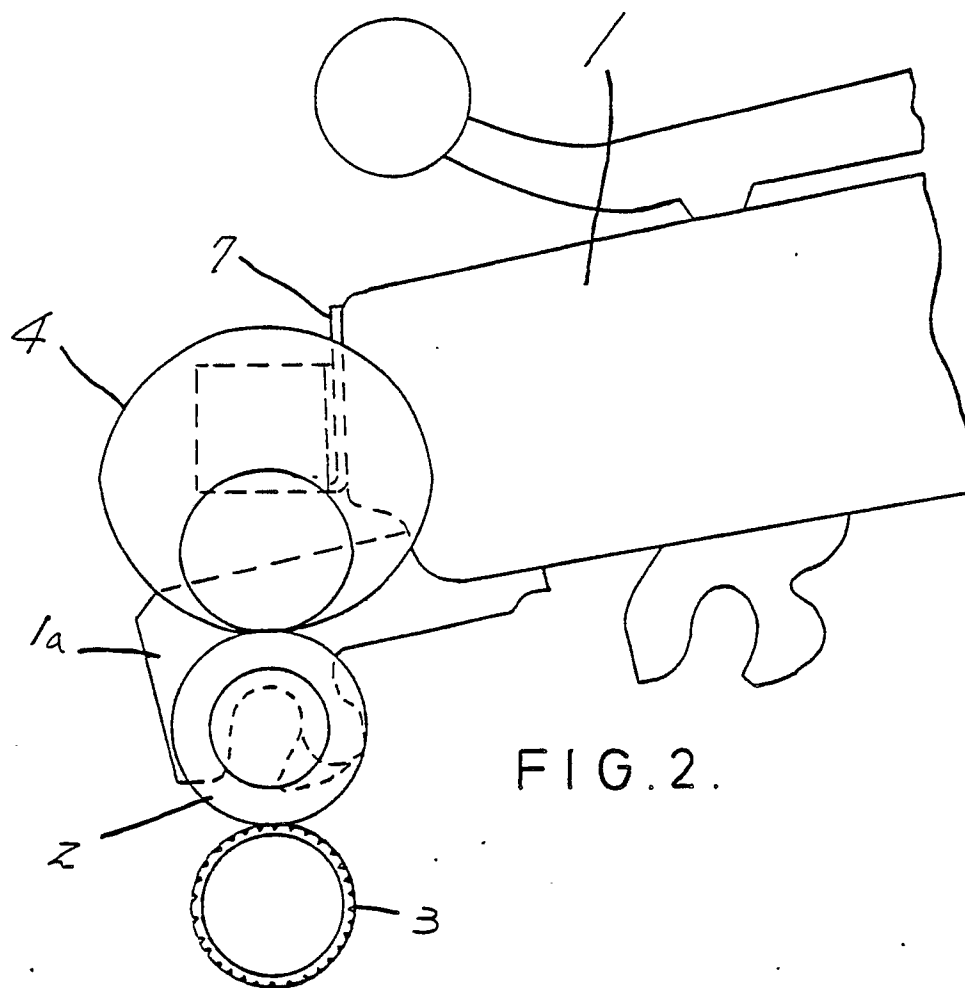


FIG. 2.

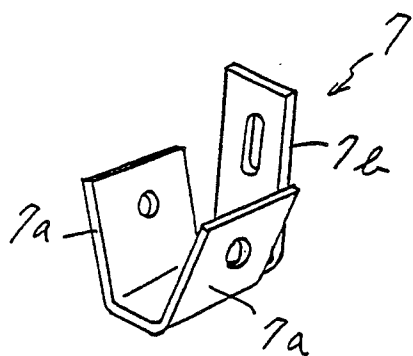


FIG. 3.

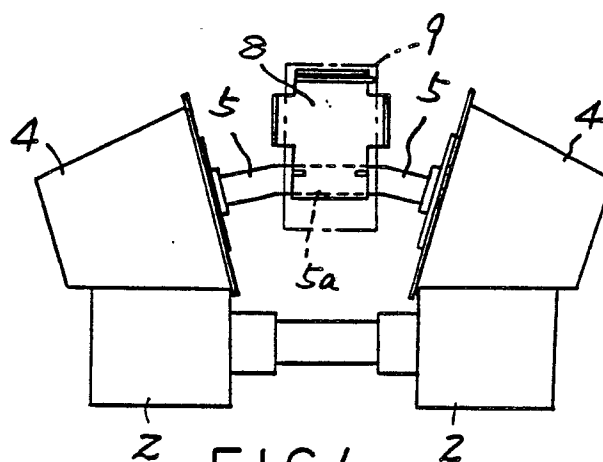


FIG. 4.

Neu eingereicht / Modified
Nouvellement déposé

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

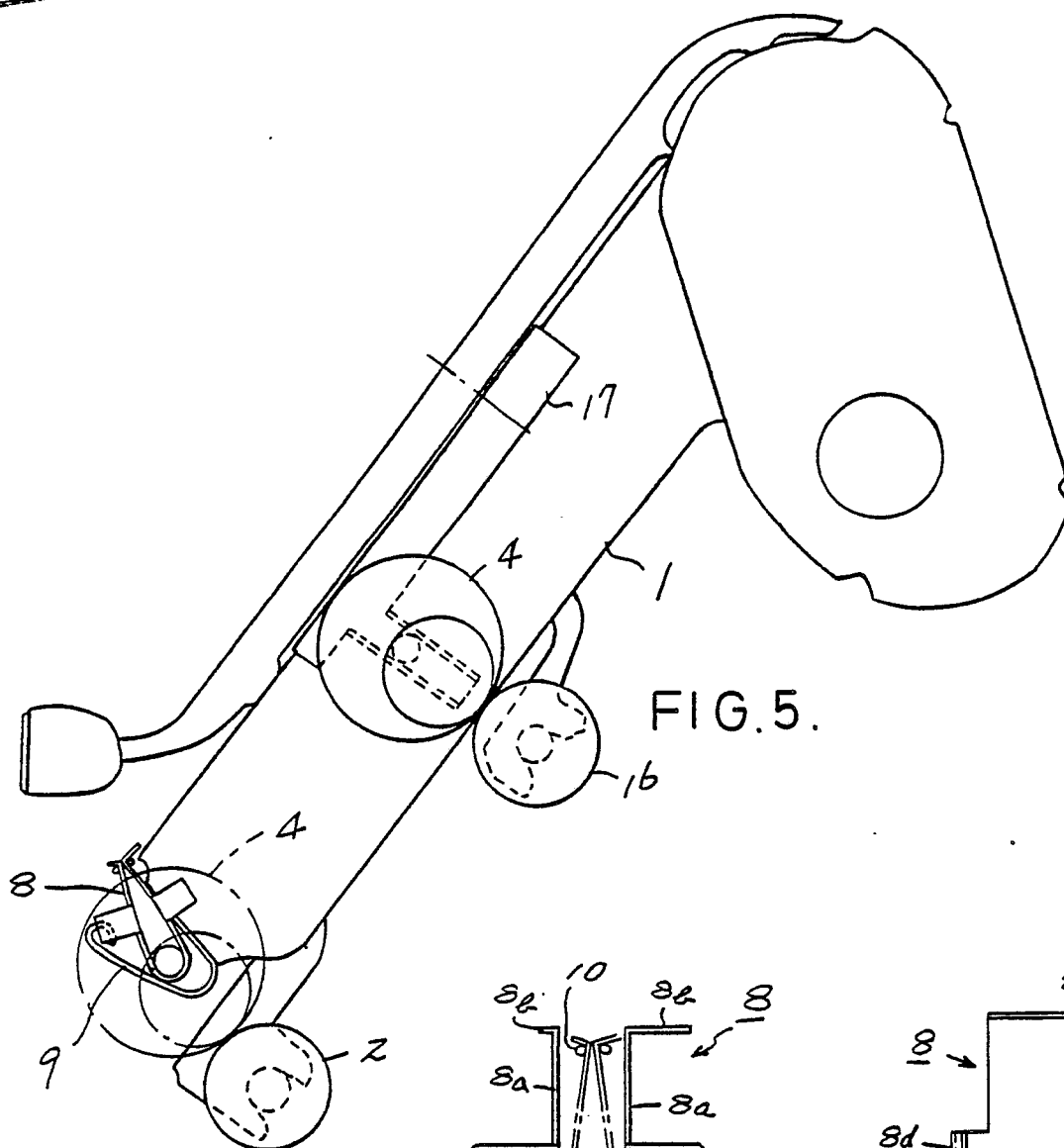


FIG. 5.

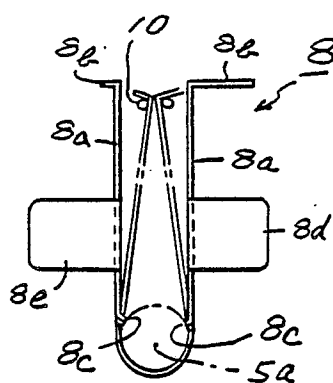


FIG. 6.

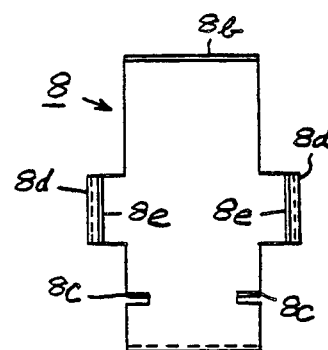


FIG. 7.

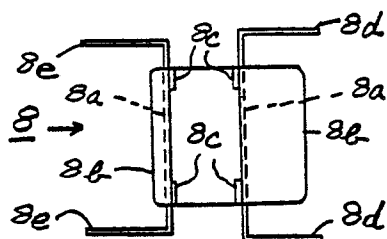


FIG. 8.

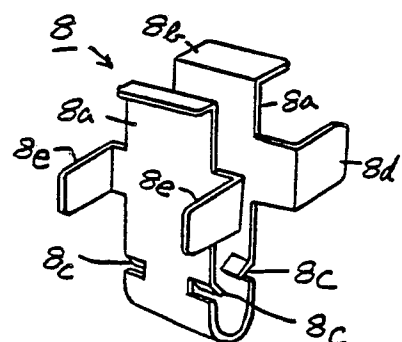


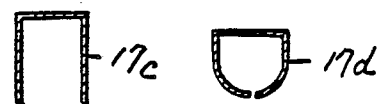
FIG. 9.

FIG. 13.

FIG. 14.

FIG. 16.

FIG.17. FIG.18.





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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US-A-1490539 (G. PUCCI) * claim 1; figures 1, 2 * ---	1	D01H5/64
X	US-A-1474144 (A. COOK) * page 1, line 47 - line 63; figures 1-3 * ---	1	
X	GB-A-225090 (W.C. FISHER) * page 2, line 38 - line 83; figures 1, 5 * ---	1	
X	GB-A-16523(A.D. 1915) (P.C. WARE) * claim 1 * ---	1	
A	GB-A-981573 (SKF KUGELLAGERFABRIKEN GMBH) * page 2, line 82 - line 96 * -----	2, 3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			D01H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 AUGUST 1989	Examiner HOEFER W.D.
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 & : member of the same patent family, corresponding document			