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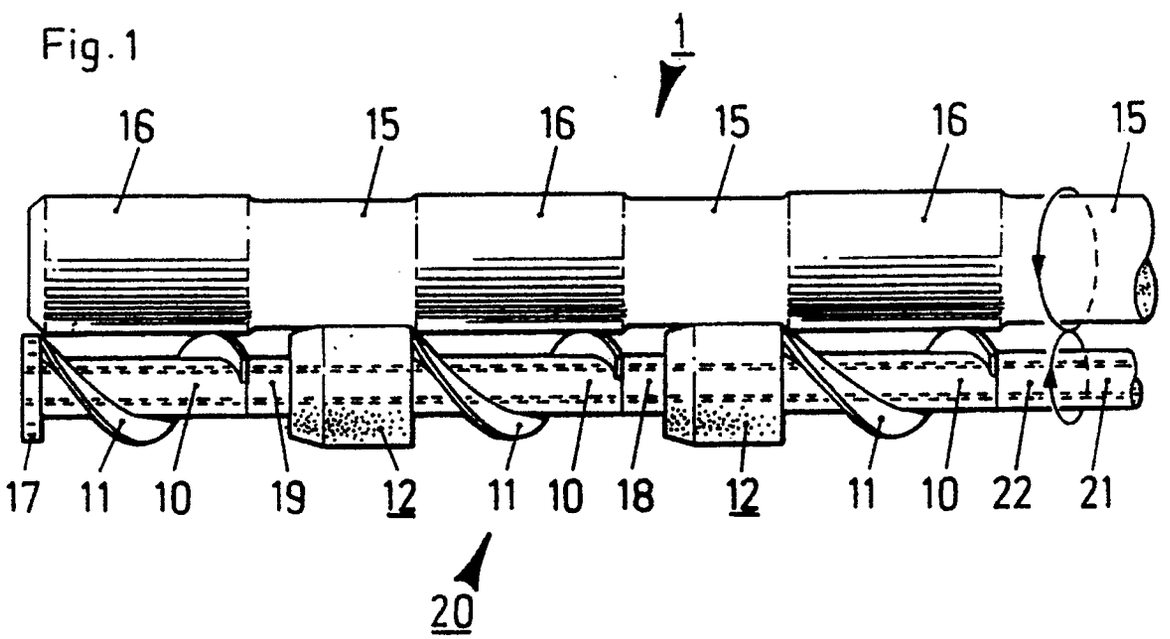
(54) Clearer for bottom rollers in textile machine.

(57) The body of a rotary type clearer is in the form of a shaft-like rotary member having narrow scraping blades (11). And a member of transmitting torque to the shaft-like rotary member having narrow scraping blades is in the form of an elastic roller (12) adapted to be pressed against the small diameter neck portion (15) of the bottom roller. Thereby, a peripheral speed differential is produced between the clearer body and the bottom roller, so that the fly and clearer wastes adhering to the surface of the bottom roller are efficiently removed. The narrow scraping blades assist in the scraping of fly and clearer wastes.

Fig. 1



EP 0 409 457 A1

CLEARER FOR BOTTOM ROLLERS IN TEXTILE MACHINE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to improvements in a clearer for bottom rollers in textile machines.

Prior Art

The draft part of a textile machine, particularly a post-process textile machine, such as a flyer frame or spinning frame is equipped with a rotary clearer having a friction member such as a hair-implanted fabric or napped fabric applied thereto to serve as a scraper for removing fly and clearer wastes.

In a conventional rotary clearer device, the clearer body is pressed against the fluted surface of the bottom roller of a textile machine under a pressing force provided by a support spring, and the bottom roller and the clearer body are rotated at the same peripheral speed by friction contact, thereby removing the fly and clearer wastes adhering to the fluted surface.

In the conventional rotary clearer device described above, since the fluted surface of the bottom roller and the clearer body are rotated by contact at the same peripheral speed, the surface of the clearer is not given the peripheral speed differential necessary for scraping fly and clearer wastes; thus, sufficient cleaning effect has not been attained. For this reason, the amount of fly and other fiber wastes adhering to the fluted surface of the bottom roller increases with the passage of operating time, causing sliver breakage, yarn breakage and other troubles.

SUMMARY OF THE INVENTION

To solve the problem described above, the present invention provides a rotary clearer for removing fly and clearer wastes adhering to the surface of a bottom roller, wherein the body of the rotary clearer is formed of a shaft-like rotary member having a narrow scraping blade.

Further, a member for transmitting torque to the shaft-like rotary member provided with the narrow scraping blade is in the form of an elastic roller adapted to be pressed against the small diameter neck portion of the bottom roller.

The transmission of torque for rotating the clearer body from the small diameter neck portion of the bottom roller by the pressing of the elastic roller results in producing a predetermined peripheral speed differential between the fluted surface of the bottom roller and the front end portion of the scraping blade of the clearer body, thereby the fly and clearer wastes adhering to the fluted surface is positively scraped. Further, the body of the clearer being formed of the shaft-like rotary member having narrow scraping bladed assists in the scraping of fly and clearer wastes. As a result further enhancing the cleaning effect on the fluted surface of the bottom roller attained by the peripheral speed differential.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view of the draft part of a spinning frame showing a first embodiment of the invention;

Fig. 2 is a schematic side view of a second embodiment of the invention;

Fig. 3 is a fragmentary enlarged side view of the clearer device shown in Fig. 2;

Fig. 4 is a side view showing the cross sectional shape of planar narrow scraping blades;

Fig. 5 is an exploded perspective view of the clearer body shown in Fig. 1;

Fig. 6A is a cross sectional view showing narrow scraping blades; and

Fig. 6B is an exploded perspective view showing the narrow scraping blades of Fig. 6A.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In Figs. 1 and 2, the reference number 1 denotes a front bottom roller; 2 denotes a second bottom roller; 3 denotes a back bottom roller; 4 denotes an apron; and 5 denotes an apron draft device composed of the apron 5 and a tenser bar 6 and interposed between front and second bottom rollers 1 and 2. The reference number 7 denotes a pneumatic flute disposed forwardly of and below the front bottom roller 1; 8 denotes a plate spring serving as a rotary support member for the rotary clearer body 10; and 9 denotes a path of travel for a spun yarn.

The body 10 of the clearer is molded of an elastically deformable synthetic resin material, e.g., urethane resin. As shown in Figs. 1 and 5, it is

formed as a shaft-like rotary member provided with a spiral vane-like narrow scraping blade 11 forming a predetermined inclinational angle 0 with the axis of the front bottom roller 1. The reference number 12 denotes elastic rollers each transmitting torque to the body 10 of the clearer, each elastic roller being composed of a cylindrical urethane resin layer 13 attractively held on the small diameter neck portion 15 of the front bottom roller 1, and a magnet 14 contained in the urethane resin layer 13. The body 10 of the clearer is formed of a highly elastic synthetic resin of high friction coefficient, e.g., urethane resin, and its length and the height of the narrow scraping blade 11 are controlled so that the front edge line portion of the narrow scraping blade 11 is urged to abut against the fluted surface 16 of the front bottom roller 1 over the entire length thereof under elastic pressing force, thereby a peripheral speed differential is produced between a fluted surface of the bottom roller 1 and a front end portion of the narrow scraping blade 11. The width t of the narrow scraping blade 11 is preferably not more than 1 mm. As for the narrow scraping blade, besides the spiral vane-like scraping blade 11 shown in Figs. 1 and 5, planar vane-like scraping blades 11A extending parallel with the axis of the front bottom roller 1 as shown in Figs. 2 and 4. only one narrow scraping blade may be used, but in both cases of the spiral vane-like scraping blade 11 and the planar vane-like scraping blade 11A, a plurality may be fixed around the shaft-like rotary member at a predetermined angular spacing. For example, the body 10 of the clearer shown in Fig. 4A has a single planar vane-like scraping blade 11A fixed thereto to extend axially, and in the body 10 of the clearer shown in Fig. 4B, three planar vane-like scraping blades 11A are fixed thereto at an angular spacing of 120° to extend axially. Further, in the body 10 of the clearer shown in Fig. 4C, two planar vane-like scraping blades 11A are fixed thereto at an angular spacing of 180° to extend axially. Alternatively, as shown in Figs. 6A and 6B, planar vane-like scraping blades 11A may be separately prepared in the form of planar plates, mounted at their roots on a shaft 21 by using set plates 11B and fixed in position by set bushings 11C. The number of scraping blades 11 or 11A is selected in accordance with the operating conditions of the textile machine. In the case where the body 10 of the clearer is constructed of a shaft-like rotary member having two or more spiral vane-like scraping blades 11, these spiral vane-like scraping blades 11 form a multiple thread construction around the shaft-like rotary member.

While the elastic roller 12 shown in Figs. 1 and 5 is formed of a concentric fit structure comprising a cylindrical urethane resin layer 13 and a magnet 14, the elastic roller 12 shown in Figs. 2 and 4 is formed of only a cylindrical urethane resin layer 13 of large friction coefficient. In the case where the diameter of the fluted surface 16 of the front bottom roller 1 is 25 mm and the diameter of the small diameter neck portion 15 is 23 mm, in order to produce a predetermined peripheral speed differential between the fluted surface 16 of the front bottom roller 1 and the scraping blade 11 or 11A, the elastic roller 12 shown in Figs. 1 and 5 is so dimensioned that the cylindrical urethane resin layer 13 has an outer diameter of 21 mm. In this case, the radius of the spiral vane-like scraping blade 11 and planar vane-like scraping blade 11A measured from the center of the elastic roller 12 is about 11 mm so that the front end edge line portion of the scraping blade can be pressed against the fluted surface 16 of the front bottom roller 1 for cleaning while maintaining the peripheral speed differential as it is being elastically deformed.

In the case where the elastic roller 12 is formed of a urethane resin layer 13 and a magnet 14 mounted therein, a torque transmission system with little slippage can be formed between the bottom roller 1 and the elastic roller 12 by utilizing the attractive force of the magnet 14 acting through the urethane resin layer 13. On the other hand, in the case where the elastic roller 12 is composed of a urethane resin layer 13 alone as shown in Figs. 2 and 4, a plate spring 8 is used as a support member for the elastic roller 12.

In the rotary clearer 20 shown in Figs. 1 and 5, a shaft 21 made of aluminum or stainless steel which is suitable for preventing decrease of the magnetic force of the magnet 14 is used as a rotary support member for the clearer body 10 and elastic roller 12. In contrast, in the rotary clearer 20 shown in Figs. 2 and 4, since the elastic roller 12 composed of the urethane resin layer 13 is used, a shaft 21 made of iron is used. In each case, the end of the shaft 21 is formed with a male thread 21a, and the clearer body 10, elastic roller 12, first collar 18, and second collar 22 are fitted on the shaft 21 in a predetermined order and are clamped and fixed in position by using an end nut 17 of synthetic resin formed with a female thread 17a adapted for threaded engagement with the male thread 21a, and a round nut 19 formed with a female thread 19a.

In the embodiment shown Fig. 1, a front bottom roller 1 having fluted surfaces 16 for six spindles is rotatably supported between unillustrated roller stands, and corresponding thereto six clearer bodies 10 each having spiral vane-like blade 11 are opposed to the fluted surfaces 16. In this case, to prevent relative axial positional shift between the clearer body 10 and the fluted surface 16, it is desirable that the three clearer bodies 10 positioned at the left-hand side between the roller

stands have their spiral vane-like scraping blades 11 turned right-handed and the three clearer bodies (not shown) positioned at the right-hand side between the roller stands have their spiral vane-like scraping blades turned left-handed.

As can be understood from the description given above, torque for the clearer body 10 is transmitted from the small diameter neck portion 15 of the front bottom roller 1 by the elastic roller 12 pressed thereagainst, whereby a predetermined peripheral speed differential is produced between the fluted surface 16 of the front bottom roller 1 and the front end portion of the scraping blade 11 or 11A of the clearer body 10 and the fluted surface 16 is strongly rubbed. Therefore, the fiber wastes such as fly and clearer wastes adhering to the fluted surface 16 is positively scraped by the rubbing of the scraping blade 11 or 11A. Further, by forming the clearer body 10 of shaft-like rotary member having narrow scraping blades 11 or 11A fixed thereon, the rubbing pressure is transmitted to the fluted surfaces 16 of the front bottom roller 1 in a concentrated load fashion. For this reason, in contrast to the use of a conventional rotary clearer device in the form of a round roller, a higher cleaning effect is produced with less power consumption.

Further, by using an elastic roller 12 of urethane resin with high friction coefficient as a member for transmitting torque to the clearer body 10, the attracting function of the magnet 14 is improved.

In the above embodiment, an example in which the rotary clearer 20 has been mounted on the front bottom roller 1 of a spinning frame having an apron type draft mechanism has been described; however, as indicated by the reference number 10A in Fig. 2, the clearer device of the invention may also be mounted is such a manner as to form common cleaning means to act on both the back roller 3 and the apron 4 wrapped around the second bottom roller 2. The use of the device of the invention is not limited to spinning frames but it may also be used as a rotary type clearer 20 for post-process textile machines such as winders and flyer frames.

The use of the device of the invention adapted to produce a predetermined peripheral speed differential between the clearer body and the bottom roller efficiently removes fly and clearer wastes adhering to the surface of the bottom roller. The fly and clearer wastes scraped from the surface of the bottom roller are slung by the spiral vane-like scraping blades or planar vane-like scraping blades; thus, the fluted surface of the bottom roller is kept clean without applying special cleaning thereto. As a result, entry of fiber wastes into the path of travel of the yarn being spun is prevented, minimizing the occurrence of yarn breakage and knotted yarn formation.

Claims

1. A rotary type clearer for removing fly and clearer wastes adhering to the surface of the bottom roller, said clearer for the bottom roller of a textile machine being characterized in that:
the body of the rotary type clearer is in the form of a shaft-like rotary member having narrow scraping blades.

2. A clearer for the bottom roller of a textile machine as set forth in Claim 1, wherein a member for transmitting torque to said shaft-like rotary member having narrow scraping blades is in the form of an elastic roller adapted to be pressed against the small diameter neck portion of said bottom roller.

Fig.1

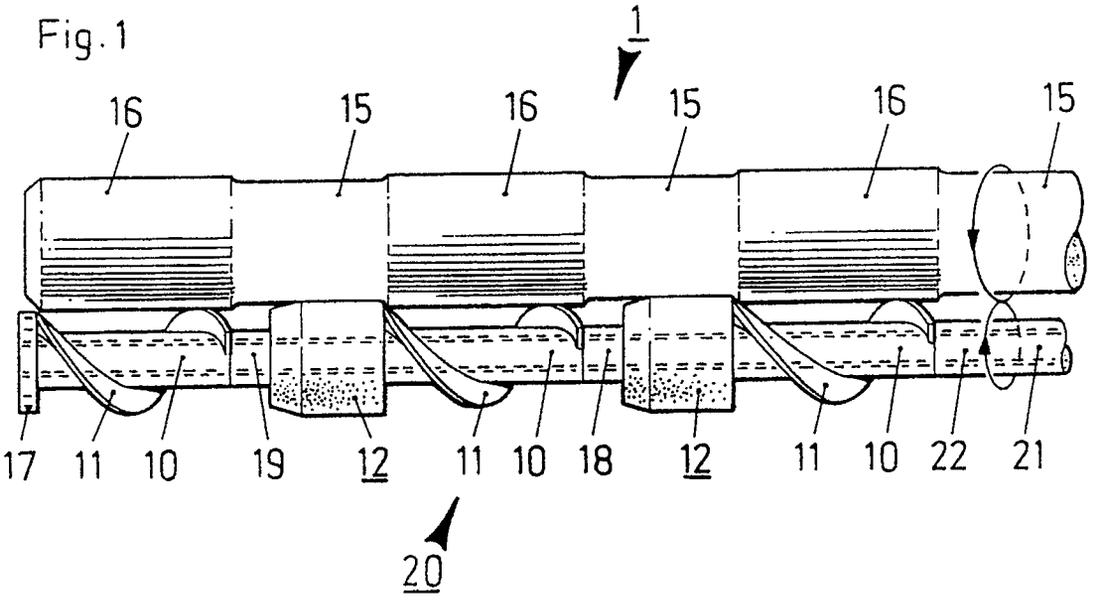

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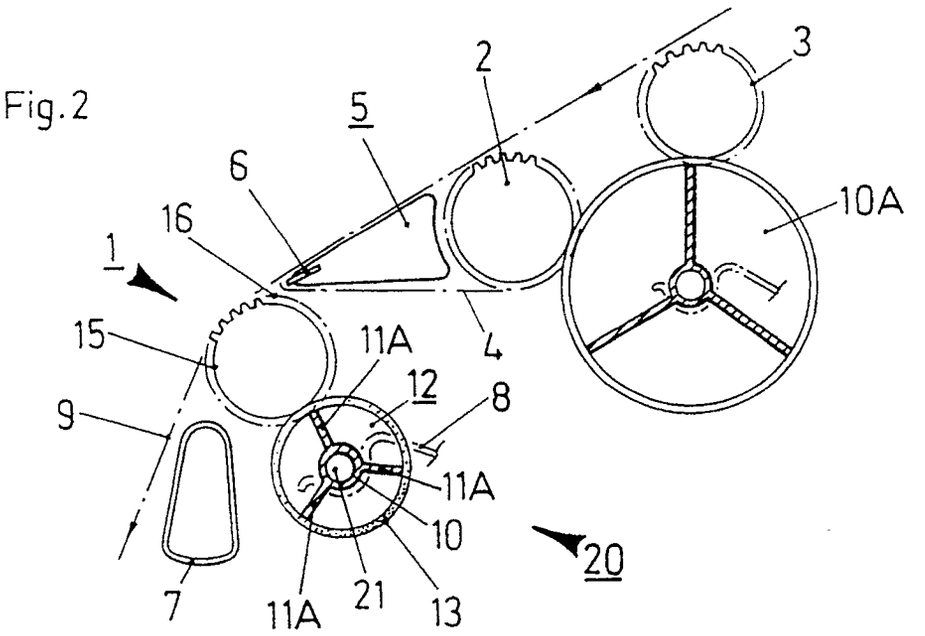
Fig.2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11A
21
13

Fig.3

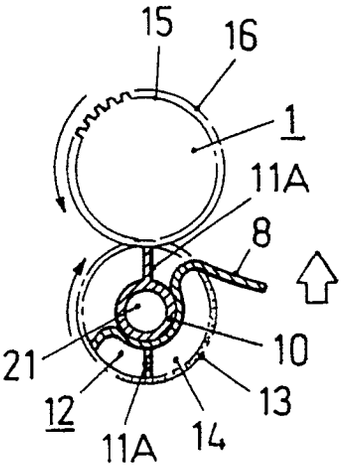


Fig.4A

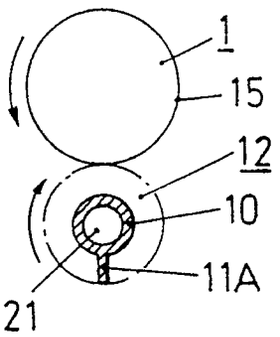


Fig.4B

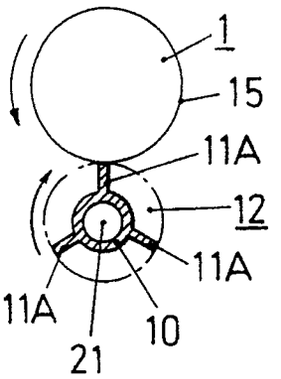


Fig.4C

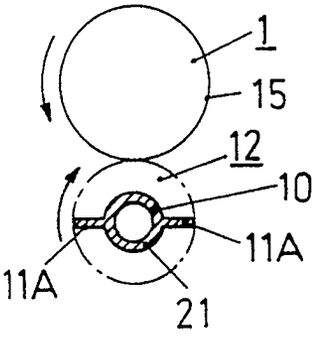


Fig. 5

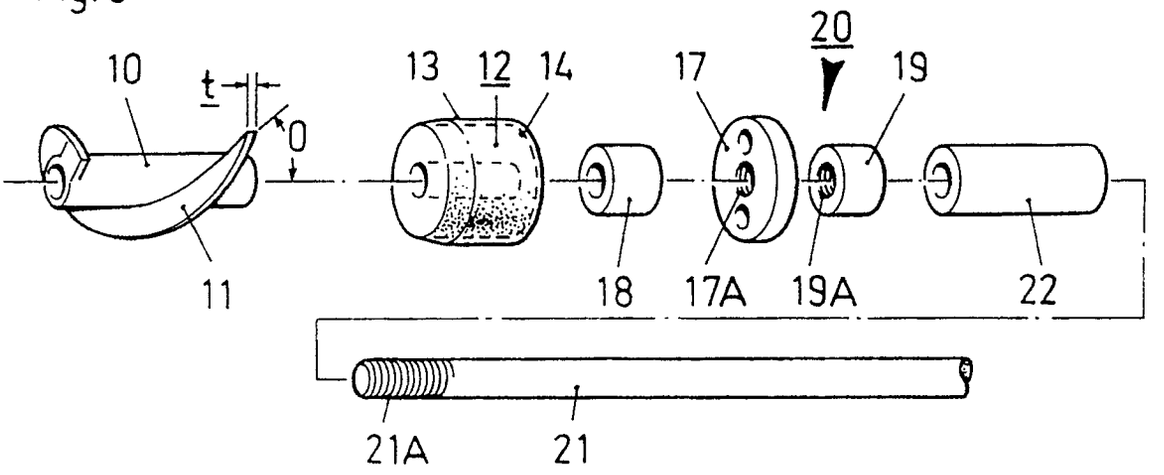


Fig. 6A

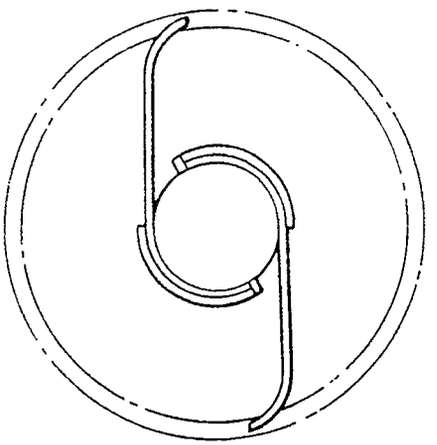
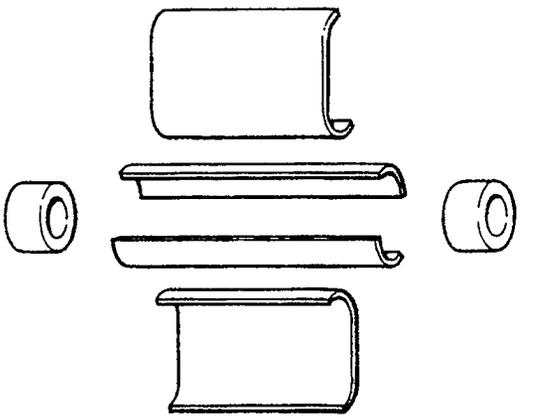


Fig. 6B



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 7442

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.5)
X,Y	US-A-2 858 576 (E.F.ROSE) * column 2, line 67 - column 3, line 2; figures 1, 3, 4 *	1,2	D 01 H 5/64
X	DE-B-1 079 513 (ERMEN & ENGELS) * claim 1 *	1	
X	DE-A-1 510 515 (R.U.BRIZZI) * claim 1; figures 1-3 *	1	
Y	DE-C-6 882 37 (H.KLUFTINGER) * page 2, lines 17 - 27; figure 3 *	2	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
D 01 H

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	26 October 90	HOEFER W.D.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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