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ARRANGEMENT FOR PROTECTING GUIDING MEMBERS AGAINST DUST AND THE LIKE

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FIG. 1

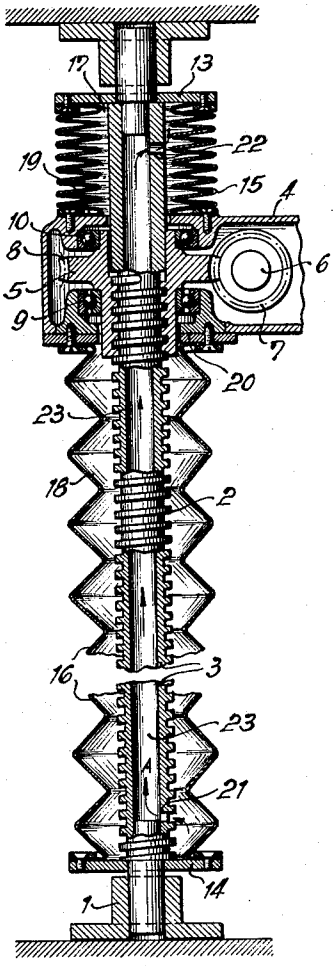



FIG. 2

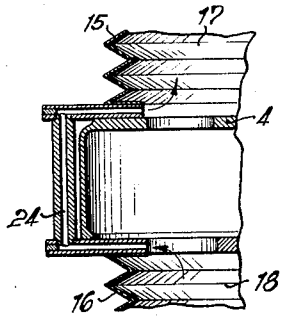



FIG. 3

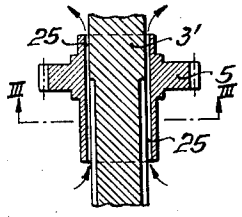
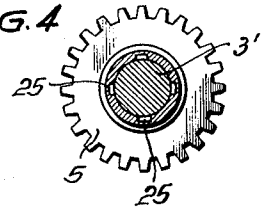



FIG. 4



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2,903,840

# ARRANGEMENT FOR PROTECTING GUIDING MEMBERS AGAINST DUST AND THE LIKE

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6 Claims. (Cl. 57—1)

The present invention relates to an arrangement for protecting guiding members, especially of textile machines, against accumulation of dust, lint and the like.

Textile machines such as spinning machines, winding machines, twisting machines and the like have numerous movable parts which are guided by guiding members. Such guiding members are for instance rods, columns, stands, rails etc. preferably having a circular or square or other cross section. Such rods, columns, stands, rails and the like are either entirely or partly surrounded by movable members. These guiding members are generally smooth, but there are also guiding members provided with a thread by means of which movable elements are automatically screwed upwardly and downwardly. As an example of such guiding members in the textile industry, the well-known columns with lifter slides for spindle and/or ring rails of spinning and twisting machines may be mentioned.

During the operation of such guiding members, frequently dust, lint and individual fibers covered with spinning grease accumulate between the guiding members and the guided elements and combine with the lubricant between said guiding members and guided elements so as to form a sticky and frequently very consistent substance which latter not only hampers or impedes the movement of the respective parts but might under certain circumstances cause the machine to stop or even to break. Particularly the grease adhering to the fibers has a very unfavorable effect in this connection.

In order to prevent dust and lint from accumulating on such vital guiding members, numerous protective devices have been suggested. The heretofore known protective devices, however, have the drawback that an air exchange between the chamber or chambers within the protective device and the room or space outside the protective device is possible so that when the chamber or chambers within the protective device reduce their volume, the air entrapped therein is pressed toward the outside, whereas when again increasing the chamber or chambers within said protective device, air and thereby dust, lint and fibers are drawn into said chamber or chambers within said protective device.

It is, therefore, an object of the present invention to provide a protective device of the above mentioned type which will overcome the drawbacks above referred to.

It is another object of this invention to provide an arrangement for protecting guiding members, especially of textile machines against the accumulation of dust, lint, fibers, etc., without affecting a smooth and reliable operation of the respective guiding members.

It is still another object of this invention to provide a protective arrangement of the type set forth in the preceding paragraphs which will be simple in construction, can easily be applied and can easily be removed in case such should be necessary for instance for purposes of repair.

These and other objects and advantages of the invention will appear more clearly from the following specification



in connection with the accompanying drawing in which:

Fig. 1 illustrates a longitudinal section through a supporting column of a ring spinning or twisting machine with an upwardly and downwardly moving spindle rail.

Fig. 2 represents a partial section through a modification of the arrangement shown in Fig. 1.

Fig. 3 represents a partial section through a further modification of the invention.

Fig. 4 is a transverse section through Fig. 3 taken along the line III—III thereof.

*General arrangement*

The primary feature of the present invention consists primarily in that the entire guiding member is enclosed in an air-tight manner, while the hollow spaces or chambers created by the guided element communicate with each other in such a manner that an air exchange and air equalization can occur between said hollow spaces or chambers. The number of such hollow spaces or chambers is greater by one hollow space or chamber than the number of the guided elements. The air equalization chambers are formed by movable envelopes or casings which surround the guiding member and are movable together with the guided member. The said air equalization chambers communicate with each other through appropriate air channels. The protective envelopes or casings may consist of foldable chambers such as bellows. The air channels may be arranged either in the guiding member or in the guided element or elements. However, they may also be arranged outside of the guiding member as well as of the guided element or elements. It is advantageous to provide means, for instance valves, somewhere in said channels so as to be able thereby to vary the cross section of said channel or channels for controlling the speed at which the air equalization will take place which in turn will affect the speed of movement of the respective movable element.

*Structural arrangement*

Referring now to the drawing in detail and Fig. 1 thereof in particular, according to the arrangement shown in Fig. 1 the guiding member consists of a supporting column 3 resting on the ground by means of a foot 1 and provided with an outer thread 2. The thread 2 is threadedly engaged by a nut 5 which by means of antifriction bearings 9, 10 rests in a lifter slide 4 for a spindle or ring rail of a spinning or twisting frame. The nut 5 is alternately rotated in one and the other direction by means of a shaft 6 through the intervention of a helical or worm wheel drive 7, 8 so that the lifter slide 4 will alternately be moved upwardly and downwardly.

Connected to the upper and lower end of the guiding element, which in Fig. 1 is represented by the column 3, are plates 13 and 14 respectively. These plates 13 and 14 close the upper and lower ends respectively of the chambers 17, 18 which are formed by bellows 15 and 16 respectively. The other end of the chambers 17 and 18 is closed by the upper and lower walls 19 and 20 respectively of the lifter slide 4. The bellows 15 and 16 are air-tightly connected to the plates 13 and 14 and the upper and lower walls 19 and 20. The guiding member 3 is thus completely enclosed by the bellows 15, 16 serving as protective arrangement according to the invention. The lifter slide or guided member 4 subdivides the space within the bellows into the two chambers 17 and 18.

According to the specific embodiment shown in Fig. 1, the guiding member 3 is designed as a hollow column and in the neighborhood of the lower and upper end thereof is respectively provided with apertures 21, 22 which serve as valves and establish communication between the in-

terior 23 of the guiding member and the chambers 18 and 17 respectively.

According to the position shown in Fig. 1, the guided member 4 occupies its uppermost position in which the chamber 17 has the smallest volume whereas the chamber 18 has its largest volume. When the guided element or lifter slide 4 moves downwardly, the air in the chamber 18 is compressed and passes in the direction of the arrow A through the lower aperture 21 into the hollow space 23 of the column or guiding member 3 and from here through the opening 22 into the chamber 17.

When subsequently the lifter slide or guided member 4 again moves upwardly, an air flow will occur in the opposite direction. Thus, due to the connection of the chambers 17 and 18, a pressure and air equalization will occur within the bellows 15 and 16. Impurities outside the envelope or bellows 15, 16 cannot reach and deposit on those parts of the guiding member which are vital for the guiding and movement of the guided element.

The air equalization between the chambers 17 and 18 may also be brought about in a different manner for instance by channel means outside the movable lifter slide or guided member 4. To this end one or more connecting channels 24 of larger or smaller cross section may be provided as shown in Fig. 2. In such an instance the guiding member or column may be solid.

It is also feasible by providing slots 25 (see Fig. 3) in the movable element 5 to allow the air to flow from one chamber 17 to the other chamber 18 and vice versa. Also in this instance, the guiding member 3' may be solid. It is of importance that the chambers 17 and 18 so to speak form one unit and are closed toward the outside.

As mentioned above, the apertures 21, 22, which may also be provided in the movable element 4 or 5 respectively may be designed as valves. In this way the movement of the movable element 4 may be cushioned and if desired the sliding speed of the movable element 4 may be controlled by increasing or decreasing the effective valve passage. If a plurality of elements are guided by the guiding members 3 or 3', the enclosure toward the outside will be effected accordingly in a manner similar to that described in connection with Fig. 1. The number of the chambers thus created will always increase by one so that when two movable or guided elements are provided, there will be three air chambers, whereas with three guided elements there will be four chambers, etc.

The bellows may be of rubber or rubber material, of treated leather or canvas or of metal. It is, of course, understood that the envelope or protective casing does not necessarily have to be in the form of bellows but may also be designed in a different way.

It is, furthermore, to be understood that the present invention is, by no means, limited to the particular constructions and arrangements shown in the drawing but also comprises any modifications within the scope of the appended claims.

What we claim is:

1. In an arrangement for protecting guiding members for movable elements, especially of textile machines, against dust and the like: a guiding member, a guided member guided by said guiding member and movable relative thereto, a plurality of expandable and collapsible bellows of substantially air-tight material surrounding said guiding member and together with said guided member and said guiding member confining a plurality of separate air-tight chambers, and substantially air-tight conduit means establishing inter-communication of the interior of said chambers while being closed toward the outside of said bellows.

2. In an arrangement for preventing dust and dirt from covering a guiding member and entering between said guiding member and guided member movable on said guiding member: a plurality of expandable and collapsible bellows of air-tight material, each of said bellows having one end connected in an air-tight manner to said guiding member and having its other end connected in an air-tight manner to said guided member so as to move in unison therewith, said bellows respectively forming separate chambers with said guiding member and said guided member, and conduit means permanently establishing communication between the interior of said chambers while being closed toward the outside thereof.

3. An arrangement according to claim 2, in which said conduit means is provided in one of said members.

4. In an arrangement for protecting the guiding members for movable elements, especially of textile machines, against dust and the like: a guiding member, a guided member movably surrounding said guiding member and guided thereby, casing means enclosing said guiding member in an air-tight manner, two expandable and collapsible bellows arranged in substantially axial alignment with each other and having their adjacent ends respectively connected to opposite sides of said casing means in an air-tight manner so as to be movable in unison with said casing means, the remote ends of said two bellows being stationarily arranged, said bellows together with said casing means surrounding said guiding member in an air-tight manner and forming with said guiding member two separate chambers closed in an air-tight manner toward the outside, and conduit means establishing permanent communication between said two chambers.

5. An arrangement according to claim 4, in which said conduit means consists of a bore extending in axial direction through said guiding member and said guided member and communicating with each of said two chambers.

6. An arrangement according to claim 4, in which said conduit means are arranged outside said casing means.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 859,637 | Adams | July 9, 1907 |
| 1,846,341 | Jung | Feb. 23, 1932 |
| 2,042,523 | Graham | June 2, 1936 |
| 2,376,383 | Richards | May 22, 1945 |
| 2,384,512 | Wiken et al. | Sept. 11, 1945 |
| 2,509,078 | Stover | May 23, 1950 |
| 2,708,563 | Bockman et al. | May 17, 1955 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 566,289 | Germany | Dec. 14, 1932 |