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[54] PNEUMATIC CLEANING APPARATUS FOR TEXTILE MACHINERY

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[58] Field of Search.....139/1 C; 19/263; 134/34, 36

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[57] ABSTRACT

A pneumatic cleaning apparatus for textile machinery is disclosed for removing fly and fiber dust from operative components and parts of the machines. There are provided a plurality of suction openings communicating with a suction device for taking up and conducting away with suction air currents the lint and fly emanating particularly from local areas of a warp stop motion, harnesses and reeds, thereby improving the quality of the woven product.

4 Claims, 2 Drawing Figures

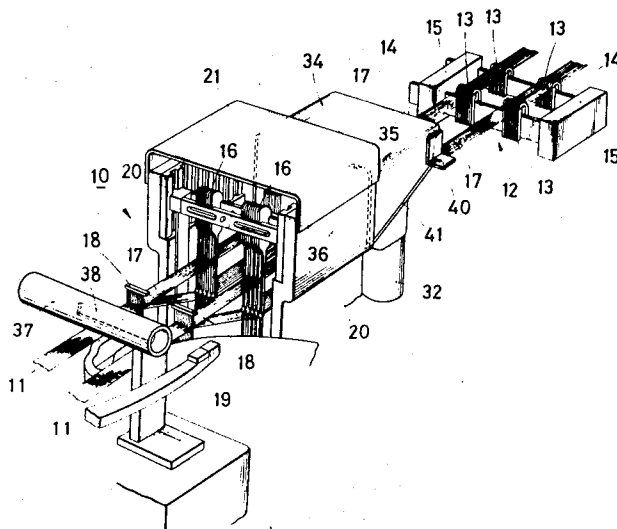


FIG. 1

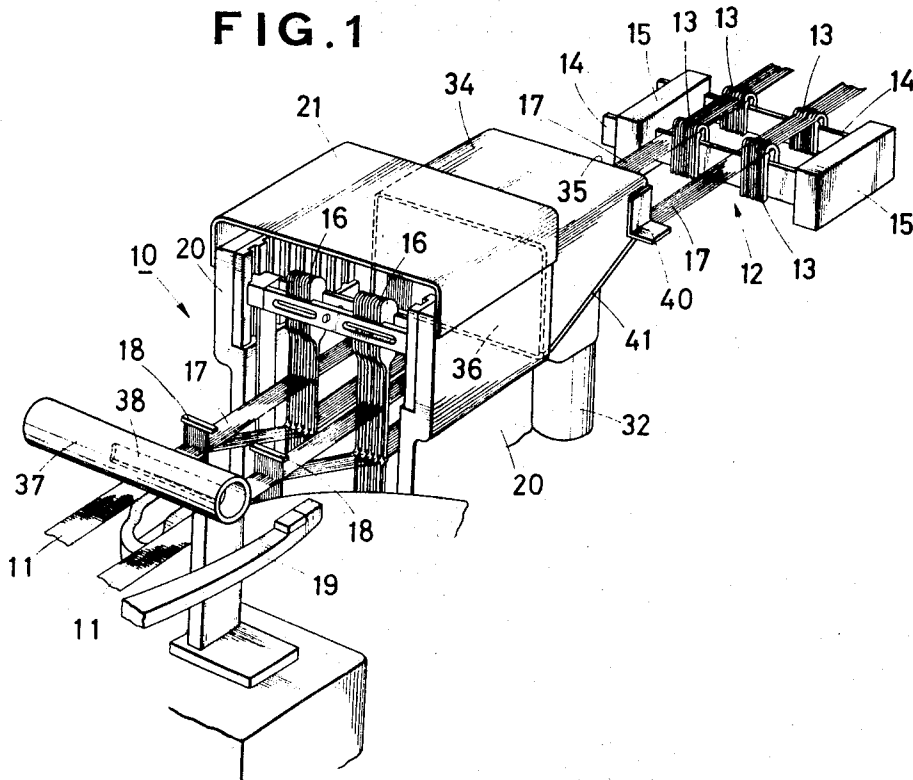
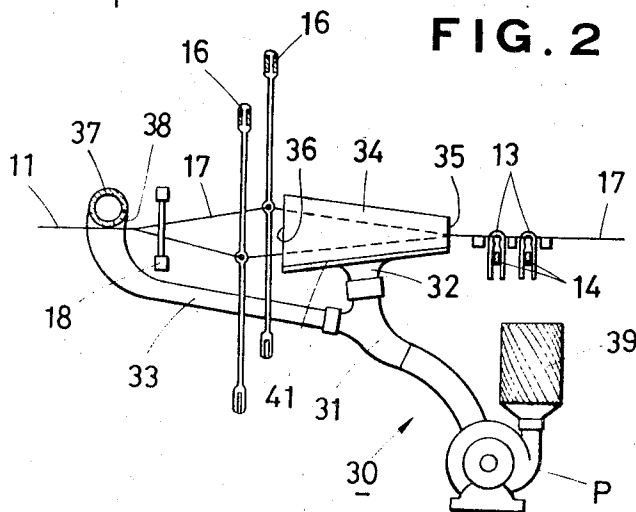


FIG. 2



PNEUMATIC CLEANING APPARATUS FOR TEXTILE MACHINERY

BACKGROUND OF THE INVENTION

This invention relates to a pneumatic cleaning apparatus and has particular reference to an apparatus for pneumatically removing and conducting away lint and fly from textile machinery.

It is important that the machines be maintained free from accumulation of lint and fly on their operating components and parts in order to make high quality woven products.

Various means have been heretofore, proposed for eliminating or reducing the amount of lint and fly settling on strategic points of the machinery. Such known means in the art are directed to removal of foreign matters containing floor dirt by blowing them off with use of large quantities of compressed air from above the loom and/or by drawing them away on suction air currents established by means of a suction device provided at the exterior of the loom. These conventional cleaning devices are necessarily large in size and complicated in mechanism as they are aimed at controlling the environmental conditions at large for maintaining the textile machinery and surrounding room free from foreign matter. However, such conventional devices despite the extravagant equipment arrangements have not proven satisfactory in the ultimate effect of fly removal particularly from such important operative parts of the loom as a warp stop motion, harness and reed where accumulation of lint and fly is pronounced. Furthermore, collected foreign matters are of little value since they contain considerable dirt and polluted materials.

SUMMARY OF THE INVENTION

It is a primary object of this invention to provide an improved means for removing lint and fly from looms which will effectively eliminate the difficulties of the prior art cleaning devices.

It is another more specific object of the invention to provide an improved pneumatically operative means of simple and compact structure for removing lint and fly particularly from strategic operating parts of a loom including a warp stop motion, harness and reed in a positive and efficient manner, thereby improving the quality of the woven product.

It is a further specific object of the invention to provide an improved means of the type capable of collecting lint and fly of useful quality and free of floor dirt as it emanates from frictional impact.

These and other objects and advantages of the invention will appear from the description taken hereinafter in connection with the accompanying drawings illustrating a preferred embodiment of the form of the invention. The fly removal apparatus embodying the invention is generally demonstrated by the characteristic arrangements in which a plurality of suction openings communicating with a pneumatic suction device are located each locally for sucking off and conducting away the lint and fly emanating from operative areas of the loom including a warp stop motion, a harness and a reed area. The suction opening for taking up lint and fly emanating from the impact of warp threads during shedding of the harness is formed in a box-like suction means at one end thereof, while the opposite end of the suction means is similarly open communicating with the said suction opening and directed towards the warp stop motion to take up lint and fly therefrom. The suction opening for drawing away therethrough lint and fly produced during operation of the reeds is conveniently directed towards the points of impact of warp and weft threads in the reeds. The lint and fly sucked through these suction openings is conducted away via common conduit means connected to a pneumatic suction device beneath the loom.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood when considering the following detailed description in conjunction with the accompanying drawing wherein:

FIG. 1 is a perspective view of the important operating parts of a loom of conventional form, showing a preferred arrangement of the fly removal apparatus embodying the invention; and

FIG. 2 is a schematic side elevation of the apparatus of the invention with parts of the loom removed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, there is shown a main operating part of a loom broadly designated by reference numeral 10, which loom is designed in the presently illustrated exemplary embodiment for weaving a tape 11 in a well known manner. The loom 10 is secured to the floor (not shown) by means of frame members (not shown) in the usual manner, and it essentially comprises a warp stop motion 12 typically comprising a group of droppers 13 supported on dropper bars 14 secured to suitable support members 15, harnesses 16 for shedding rows of warp threads 17 and reeds 18 for beating weft threads (not shown) into warp threads. Designated at 19 is a supporting bar for movably carrying a needle (not shown) for picking and inserting weft threads through warp threads. Designated at 20 is a pair of side guard frames for the harness area and connected by a removable top cover 21. Other complementary components and parts of the loom are omitted from the illustration for the sake of brevity and because they have little bearing upon the function of the inventive fly removal apparatus.

As already set forth, the origin of lint and fly is local predominantly at the warp stop motion 12 where warp threads 17 are frictionally engaged in the droppers 13, at the areas of harnesses 16 where warp threads are frequently impacted during the shedding operation and at the areas of reeds 18 where weft threads are beat into warp threads.

Lint and fly is effectively and efficiently removed by the improved fly removal apparatus generally designated at 30 which comprises essentially a suction pump P producing suction air currents, a common suction conduit means 31 connected with and extending from the pump P, a first branch conduit means 32 and a second branch conduit means 33 tying into the common suction conduit means 31, a suction box means 34 located in the path of warp threads 17 between the warp stop motion 12 and the harnesses 16 and having a first suction opening 35 directed towards the warp stop motion 12 and a second suction opening 36 directed towards the harnesses 16, said box means being operatively connected to said first branch conduit means, a cylindrical member 37 having a longitudinally elongated suction opening 38 directed towards the reeds 18, said cylindrical member being operatively connected to said second branch conduit means, and a collecting means 39 connected to a discharge side of the pump for collecting therein the lint and fly that has been conducted on suction air currents produced by the pump P. As better seen in FIG. 2, the suction box means 34 may be conveniently provided with a tab 40 with which to open the box 34 from one side as at 41, thereby providing access to warp threads in the box means. As also shown, the second suction opening 36 is wide enough not to interfere with the shedding motion of warp threads 17, while the first suction opening 35 is converged to provide sufficient suction force to suck and remove lint and fly from off the points of frictional engagement of warp threads with the respective droppers 13. Removal of lint and fly from these points is particularly important to prevent its settlement upon the dropper bars 14 which would otherwise cause operational failure of the warp stop motion 12. This is more so where the warp stop motion is of an electrical function.

With this construction, lint and fly emanating from the areas of warp stop motion 12 is taken up and conducted away with suction air currents directed through the first suction opening 35. In a similar manner, the lint and fly produced in the areas of harnesses 16 or from shedding of the warp threads 17 is sucked and carried by suction air currents directed through the second suction opening 36. Finally, the lint and fly resulting from operation of the reeds 18 is taken up through the

elongated longitudinal opening 38 formed in the cylindrical member 37. All lint and fly thus sucked in through the various suction openings is conducted by suction air currents through the respective branch conduit means 32 and 33, passed together through the common conduit means 31, and withdrawn via pump P into the fly collector 39. This collector 39 is preferably made of a wire screen of a mesh size suitable to catch and retain the fly therein, while allowing the air currents to escape to the atmosphere.

It is to be noted that the lint and fly collected in the manner herein advanced is clean and substantially free of other undesired foreign matters such as dirt from foot traffic. Hence, such collected lint and fly has high commercial value and may find application, for example, for cushioning materials.

While there is shown and described a preferred embodiment of the invention using specific terms, it is to be understood that the invention is not limited thereto but may be otherwise variously embodied and practiced within the scope of the appended claims.

What is claimed is:

1. An apparatus for cleaning lint and fly from operative areas of a loom including a warp stop motion, harnesses and reeds, which comprises: a suction pump producing suction air

currents, a common suction conduit means connected with and extending from said pump, a first branch conduit means and a second branch conduit means connected with said common suction conduit, a suction box means having a first suction opening directed towards the warp stop motion and a second suction opening directed towards the harnesses, said box means being operatively connected to said first branch conduit means, a cylindrical member having a longitudinal elongated suction opening directed towards the reeds, said cylindrical member being operatively connected to said second branch conduit means, and a collecting means connected with a discharge side of said pump for collecting the lint and fly that has been conducted on suction air currents.

2. An apparatus as set forth in claim 1 wherein said first suction opening is converged relative to said second suction opening to provide increased suction force thereat.

3. An apparatus as set forth in claim 1 wherein said collecting means is made of a wire screen.

4. An apparatus as set forth in claim 1 wherein said suction box means is located in the path of warp threads between the warp stop motion and the harnesses.

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