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R. A. GRIMSTON ET AL

3,624,860

DOCTORS FOR PAPERMAKING MACHINES

Filed Sept. 26, 1969

2 Sheets-Sheet 1

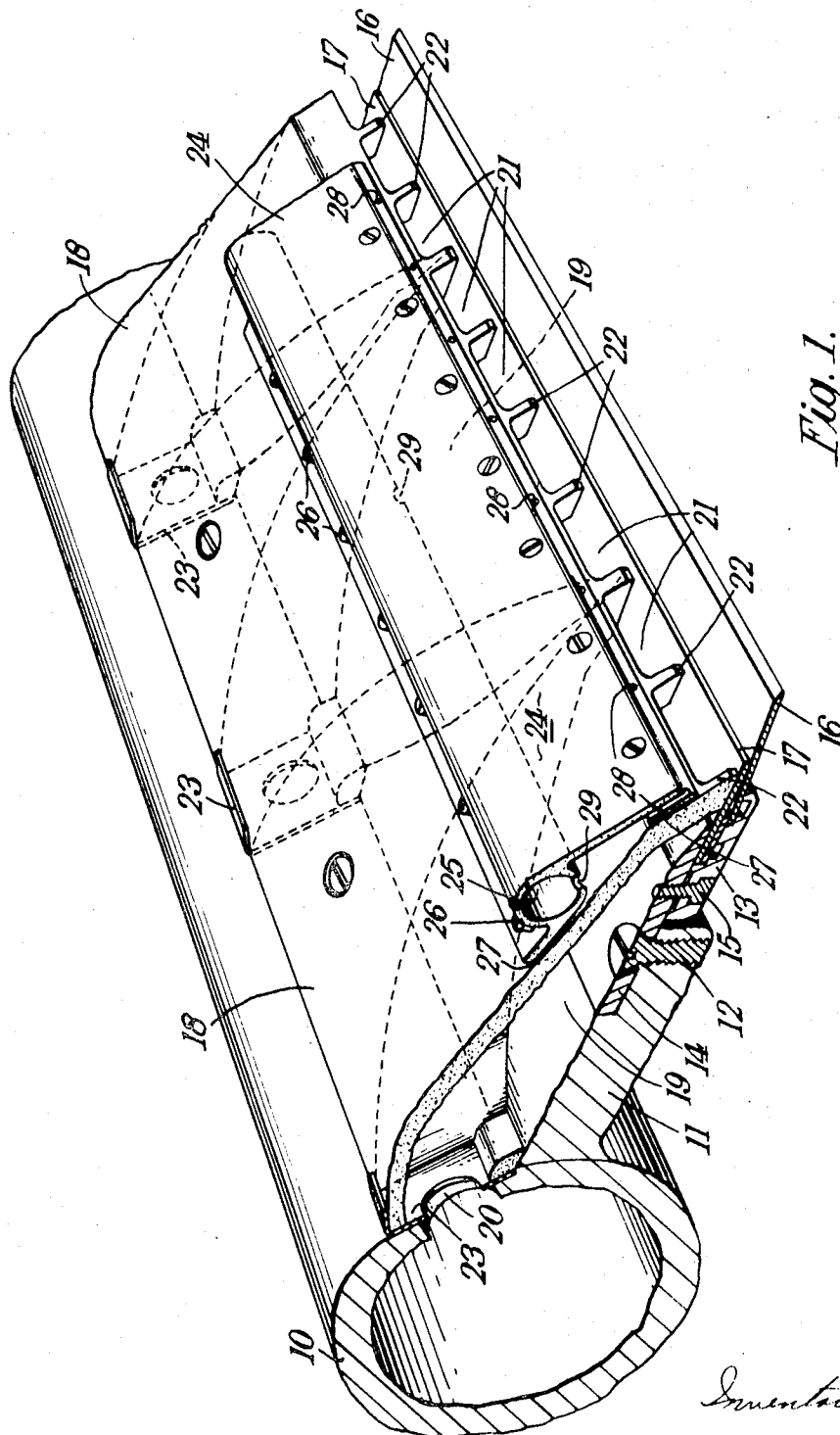


Fig. 1.

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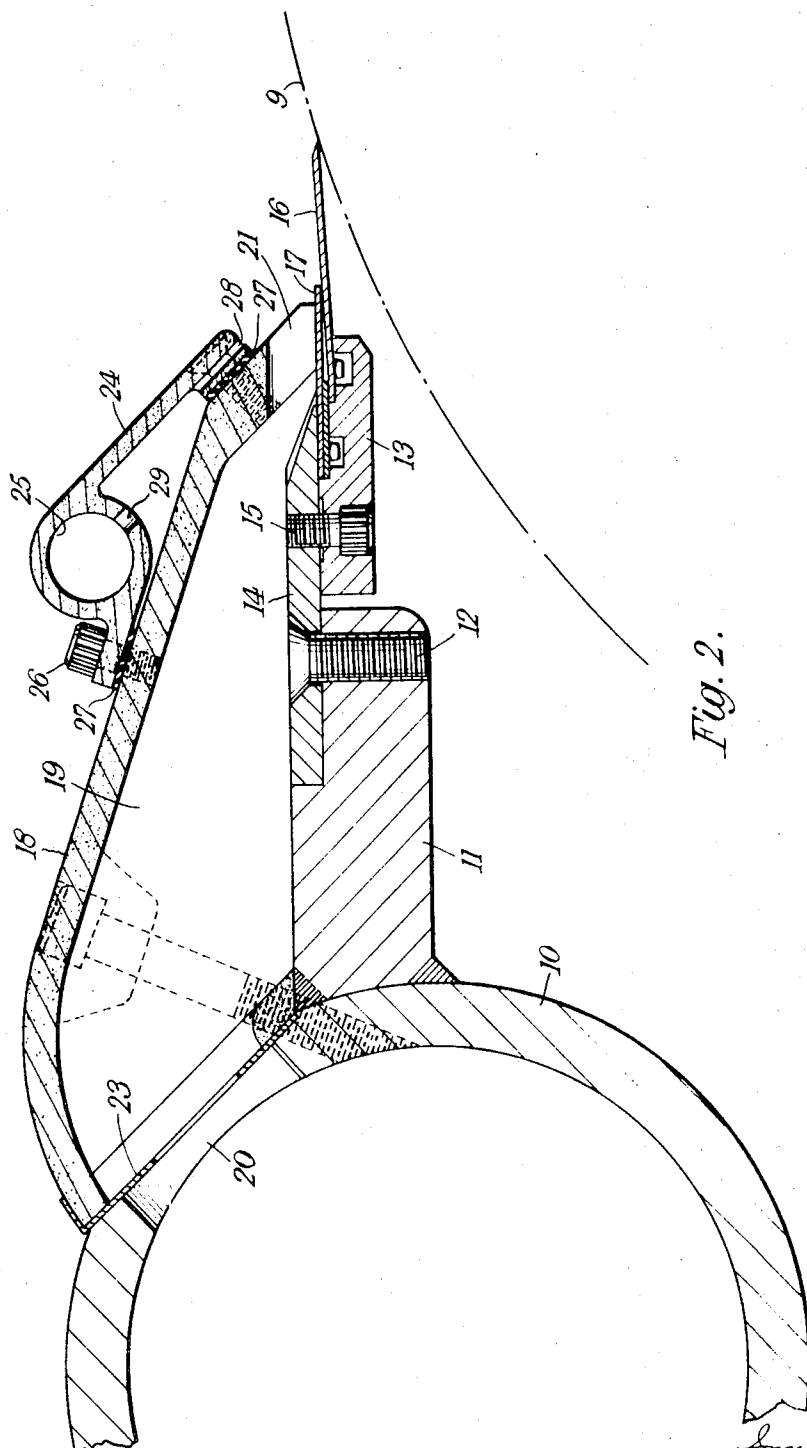


Fig. 2.

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DOCTORS FOR PAPERMAKING MACHINES

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U.S. Cl. 15—308

3 Claims 10

ABSTRACT OF THE DISCLOSURE

The invention provides a doctor for doctoring a roll of a papermaking machine, in which the support for the doctor blade includes a suction duct extending for the full length of the blade, contiguous suction nozzles extending forwardly from the suction duct to apply uniform suction to the blade, the nozzles providing a continuous wall extending rearwardly at a gradual inclination from the side of the blade remote from the roll, and an air blast duct mounted on the wall and having air blast nozzles situated between the suction nozzles and operative to discharge intermittently a substantially uniform flow of air towards the blade for the purpose of dislodging fuzz from the portions of the wall between the suction nozzles.

This invention relates to a doctor for doctoring a roll of a papermaking machine of the type in which the support for the doctor blade includes a suction duct extending for the length of the blade and provided with suction nozzles which extend forwardly from the suction duct and apply uniform suction to the blade for the purpose of removing from the blade dust and fluff which have been scraped from the roll by the blade.

In U.S. Pat. No. 3,264,673 there is described a doctor of this type in which the nozzles are contiguous and provide a continuous wall extending rearwardly at a gradual inclination from the side of the doctor blade remote from the roll, and in which each nozzle contains a readily removable orifice plate accommodated in a slot in the nozzle, the orifice plates having graded orifices which provide uniformity of suction through the nozzles and being removable from and replaceable into their slots by sliding movement.

In such a doctor the wall provided by the contiguous suction nozzles serves to guide broken paper web away from the doctor blade and to prevent such broken web from bunching up around the nozzles. Since the orifice plates are slidable in their slots, they may be exchanged for others, as and when necessary, without disturbance or dismantling of any other part of the doctor.

U.S. Pat. No. 3,264,673 also provides for the provision of an intermittent air blast for the purpose of dislodging fuzz, i.e. an accumulation of long fibres, from the portions of the wall between the nozzles.

The present invention provides a doctor for doctoring a roll of a papermaking machine, in which the support for the doctor blade includes a suction duct extending for the full length of the blade, contiguous suction nozzles extending forwardly from the suction duct to apply uniform suction to the blade, the nozzles providing a continuous wall extending rearwardly at a gradual inclination from the side of the blade remote from the roll, and an air blast duct mounted on the wall and having air blast nozzles situated between the suction nozzles and operative to discharge intermittently a substantially uniform flow of air towards the blade for the purpose of dislodging fuzz from the portions of the wall between the suction nozzles.

The air under pressure is most conveniently introduced into the air blast duct at one end of the duct. In the case of a long doctor the drop of pressure in the air blast duct may be considerable, for example from 20 p.s.i. at the entry end to 10 p.s.i. at the other end. It would be possible to provide the desired uniform flow of air through the air blast nozzles by making these of graded size but this would be highly inconvenient. Firstly the air blast nozzles are numerous, for example they may be spaced at intervals of 2" to 6" along the length of the doctor. Secondly they are small, having in a typical case a diameter of $\frac{1}{16}$ ".

Preferably therefore the air blast duct is constituted by a hood mounted on the wall and having air blast nozzles of uniform size at its forward end and an air blast pipe within the hood having an inlet for air under pressure at one end and having primary air distribution holes of graded size through which air is discharged from the pipe into the hood. The primary air distribution holes may be relatively widely spaced, e.g. at intervals of 2 to 3 feet and are conveniently of a considerably larger size than the air blast nozzles, e.g. of $\frac{1}{4}$ " average diameter. Grading of the size of these holes by an amount in the range for example of $\pm\frac{1}{16}$ " to provide a uniform flow of air through the air blast nozzles is therefore a comparatively simple matter. Alternatively, the spacing of these holes may be adjusted to give uniform flow while maintaining a standard size.

One embodiment of doctor according to the invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a partial perspective view of the doctor and

FIG. 2 is a cross section.

The doctor illustrated includes a suction tube 10 extending for the length of the roll 9 to be doctoring. Welded to the tube 10 is a bracket 11, to which is fixed by screws 12 the blade holder of the doctor. This consists of plates 13, 14 fixed together by screws 15 and carrying the doctor blade 16 and a pressure plate 17.

A wall 18, extending forwardly from the tube 10, is formed with suction nozzles 19 which communicate with the tube by orifices 20 and terminate in suction orifices 21 situated immediately above the pressure plate 17 and separated by tips 22. The suction across the doctor blade is rendered uniform by orifice plates 23 as described in U.S. Pat. No. 3,264,673.

An air blast duct, constituted by a hood 24 and an air blast tube 25, is secured to the wall 18 by screws 26, rubber gaskets 27 being interposed between the air blast duct and the wall. The hood is formed with air blast nozzles 28 situated above the tips 22. The air blast nozzles 28 are of equal size and the air under pressure is distributed from the tube 25 to the nozzles by primary air distribution holes 29 which are graded in size to secure uniform flow of air through the nozzles 28. The air under pressure is supplied intermittently to one end of the tube 25 and may be controlled manually, or automatically by a timer which turns on the air blast for a short period at predetermined intervals according to the rate of accumulation of fuzz. Thus by way of example the air blast may be switched on for one second at intervals of ten seconds to five minutes.

The air blast duct is provided with end walls (not shown) and extends for the full length of the doctor.

What we claim as our invention and desire to secure by Letters Patent is:

1. A doctor for doctoring a roll of papermaking machine, comprising a doctor blade which extends lengthwise of the roll to be doctoring, a support carrying said doctor blade and including a suction duct extending for the full length of the blade, contiguous suction nozzles

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extending forwardly from the suction duct to apply uniform suction to the blade, the nozzles providing a continuous wall extending rearwardly at a gradual inclination from the side of the blade remote from the roll and an air blast duct constituted by a hood mounted on the wall and having at its forward end air blast nozzles of uniform size situated between the suction nozzles, and an air blast tube having an inlet for air under pressure at one end and having primary air distribution holes, through which air is discharged from said tube into the hood, the primary air distribution holes being more widely spaced than the air blast nozzles and providing for a substantially uniform flow of air towards the blade through the air-blast nozzles, for the purpose of dislodging fuzz from the portions of the wall between the suction nozzles when air under pressure is introduced intermittently into said end of the air blast tube.

2. A doctor as claimed in claim 1, in which the air blast tube is disposed within the hood.

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3. A doctor as claimed in claim 1, in which the primary air distribution holes are spaced uniformly, are of larger size than the air-blast nozzles and are of graded size to provide the substantially uniform flow of air through the air-blast nozzles.

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LEON G. MACHLIN, Primary Examiner

U.S. Cl. X.R.

15—256.51