Feb. 24, 1931. A. E. BROUGHTON 1,794,058

CLEANER FOR PAPER DRIERS

Filed June 2, 1928 2 Sheets-Sheet 1

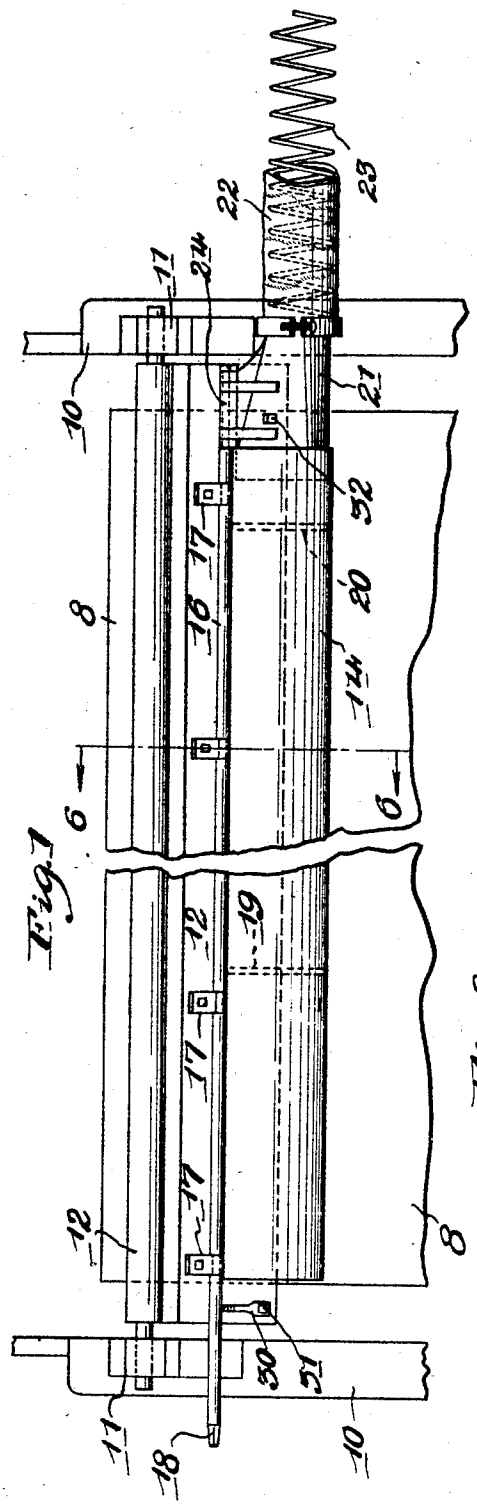


Fig. 1

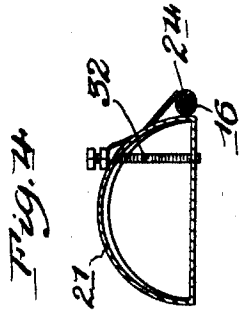


Fig. 4

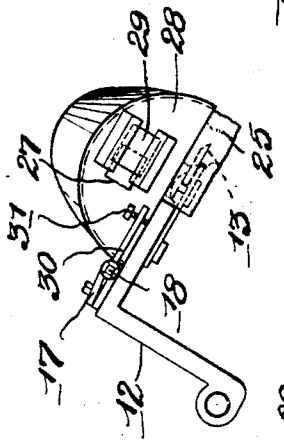


Fig. 2

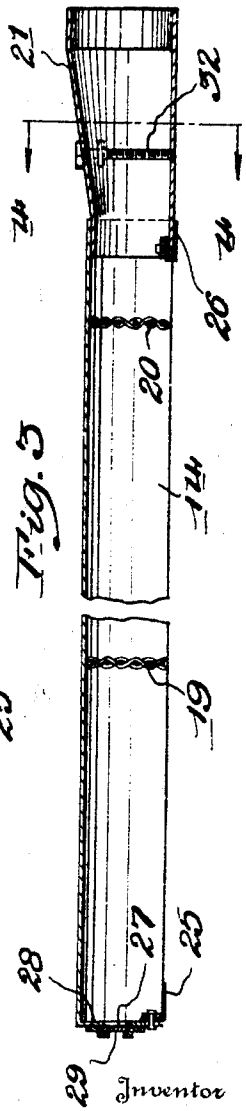


Fig. 3

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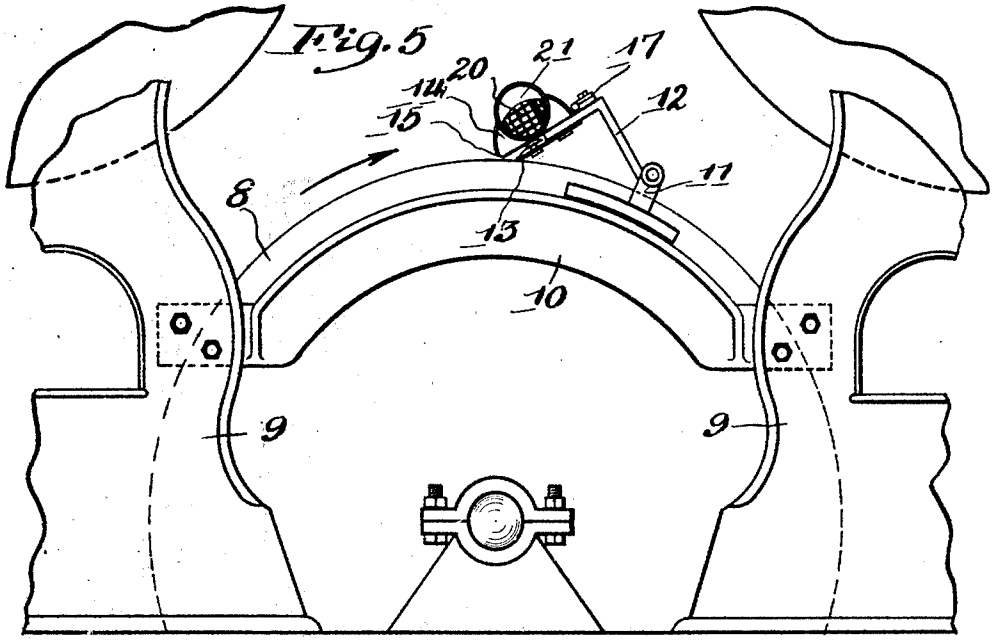
Attorneys

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Fig. 5



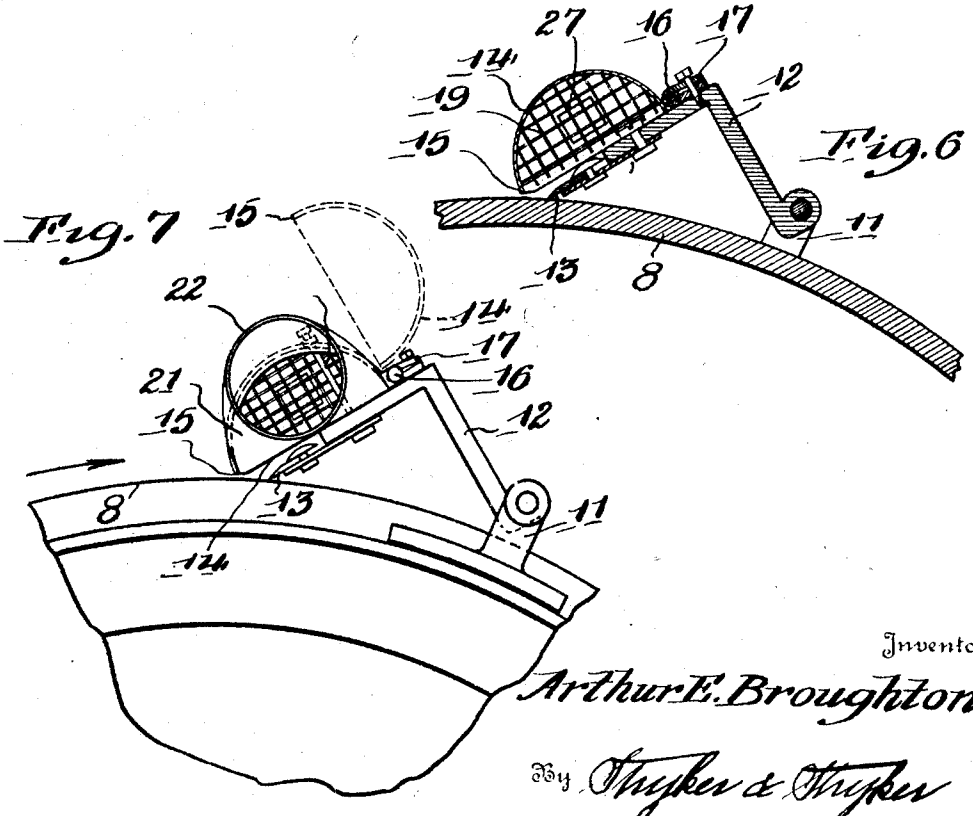


Fig. 6

Fig. 7

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UNITED STATES PATENT OFFICE

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CLEANER FOR PAPER DRIERS

Application filed June 2, 1928. Serial No. 282,411.

This invention relates to a device for continuously removing particles of fibre and sizing, and the like, which are deposited upon the revolving rolls of paper drying machinery. As is well known, the wet paper web in passing over the peripheries of the driers deposits particles of sizing and fibers which adhere to the rolls and in time form a coating. If the particles are allowed to accumulate, the rate of drying is reduced and rough surfaces are formed on the paper. The surface deposit on the rolls is particularly troublesome where the paper stock of the web to be dried contains a large amount of sizing. Attempts have been made to remove such matter during the operation of the driers by applying a scraper which merely loosens the coating and allows it to be redeposited upon the paper web. However, the particles so replaced on the paper web give the sheet such a spotted and uneven surface that this method of removing the coating is considered impractical for the manufacture of the better grades of paper. Accordingly, it is the generally adopted practice to periodically shut down the operation of the driers in order to permit the removal of the objectionable deposits.

It is my object to obviate the necessity for shutting down the driers for the removal of such deposits, and at the same time to prevent redepositing of the particles upon the paper web by providing mechanism adapted to scrape the adhering particles from the rolls and immediately convey them away from the machine.

A further object is to provide a highly practical and efficient device of this kind in which the objectionable particles are removed by a current of air passed through a conduit or hood embracing the working edge of the removal blade.

Other objects are to provide in a device of this kind construction adapted to facilitate the removal of portions of the paper web from the hood when, as sometimes occurs, said web breaks in operation and to otherwise meet the practical requirements of operation by providing means for readily swinging the device to an inoperative position where it is out of the way.

Referring to the accompanying drawings, Figure 1 is a plan view of my invention together with the adjacent portions of a paper drier of common type; Fig. 2 is an end view of the device removed from the drier and showing the left end as seen in Fig. 1; Fig. 3 is a longitudinal section through the hood and connected end of the air conduit; Fig. 4 is a detail, sectional view taken on the line 4—4 of Fig. 3; Fig. 5 shows the right end of the device as viewed in Fig. 1, together with fragmentary portions of the drier upon which it is mounted; Fig. 6 is a typical transverse section taken on the line 6—6 of Fig. 1 and Fig. 7 is an enlarged end view of the device and its support.

As illustrated my device is applied to a cylindrical paper drier 8 and is preferably located upon one or more of the drying rolls at or near the wet end of the machine. The drier is of the common type provided with standards 9 at opposite ends of the several rolls. These standards 9 support bearings for the several drying rolls 8 as shown in Fig. 5. A pair of frame members 10 are secured at their ends to the standards 9 and are arched upward adjacent to the periphery of the roll 8 to afford supports for bearings 11. Journaled in these bearings 11 is an angular casting 12 which carries on its free extremity a flexible blade or scraper 13 like the so-called "doctor blades" in common use. This scraper 13 extends parallel to the axis of the drier 8 and substantially the length thereof so as to loosen fibrous particles, sizing and other objectionable deposits upon the peripheral surface of the drier when the latter is rotated, as in operation.

A hood 14 is arranged to extend longitudinally upon the casting 12 to collect the particles removed by the scraper 13. This hood caps or covers the scraper 13 and has an edge 15 which extends closely adjacent to the periphery of the drier 8 along a line parallel to and near the working edge of the scraper 13. The opposite longitudinal edge of the hood 14 is secured to a shaft 16 which is pivoted in a series of bearings 17 bolted to

the casting 12. An end 18 of the shaft 16 projects from an end of the drier and is formed to be turned by a crank, wrench, or the like, to swing the hood to open or dotted line position shown in Fig. 7. Large mesh screens 19 and 20 extend transverse the hood 14 to prevent the passage of portions of the paper web, which sometimes breaks in the operation of the machine, from passing into a conduit 21 for air. The receiving end of the conduit 21 fits within one end of the hood 14 as shown in Fig. 3, said end being semi-circular in cross sectional shape as shown in Fig. 4. The other end of the conduit 21 is preferably circular in form to connect with a large flexible hose 22 adapted to communicate with a suitable motor driven suction pump or fan (not shown). The hose 22 may be provided with a fabric cover which is held in extended position by an interior, spirally wound spring 23. A sleeve 24, revoluble on the shaft 16, is rigidly secured to the conduit 21 to connect the same with the hood 14. The end of the hood 14 which overlaps the conduit 21 is not directly connected thereto but is free to permit swinging the hood to open position independently of the conduit 21.

It will be evident that one side of the hood 14 is open when the same is raised from the scraper 13, as shown in dotted lines in Fig. 7, but when the hood is closed, or in normal operating position, the otherwise open side is closed by the drier 8, scraper 13 and supporting casting 12. Because of irregularities in the upper surface of the scraper 13 and support, I prefer to secure on one end of the hood 14 a flexible flap 25 and a similar flap 26 is secured to the bottom surface of the conduit 21, as shown in Fig. 3. These flaps are drawn to closed position by the suction in the hood in operation.

To facilitate creating a draft longitudinally through the hood 14, when in operation, I provide a small opening 27 in an otherwise closed end 28 remote from the conduit 21. The extent of this opening may be adjusted by a small sliding door 29 mounted upon the outer surface of the end 28. An arm 30 is fixed on the shaft 16 to project adjacent to the upper surface of the casting 12 and in the extremity of this arm is threaded an adjusting screw 31. Near the opposite end of the hood another adjusting screw 32 is threaded in the conduit 21 and arranged to bear against the casting 12 at its lower end. These screws 31 and 32 afford means for holding the edge 15 of the hood 14 out of contact with the drier 8, but in close proximity thereto, so that an opening of the desired size is provided along the working edge of the scraper 13.

The cross sectional area of the conduit 21 is substantially equal to the corresponding area of the hood 14 and the several intake openings in the hood are of such size as to maintain the desired velocity of air for picking up and conveying away the particles of matter loosened by the scraper 13.

In use the hose 22 is connected to the suction intake of a motor driven fan or pump of any suitable or well known construction so that a vacuum is created in the hood 14. This hood, in its normal operating position, is closed, except for the opening 27 and space between the edge 15 and periphery of the drier 8. The blade 13, which is flexible, rests upon the periphery of the roll and is adapted to remove the objectionable deposit. The drier roll 8 is operated in the usual manner and in the direction indicated by arrows in Figs. 5 and 7. The deposit to be removed from the periphery of the roll 8 is carried beneath the hood 14 and is loosened by the blade 13. The particles thus loosened are immediately picked up by the draft of air entering between the roll 8 and edge 15 of the hood 14 and carried longitudinally through the hood into the conduit 21 and hose 22, being delivered by the latter to the power driven suction means whence they are discharged in a suitable place of disposal. If, as sometimes happens in the operation of a drier, the paper web breaks and tends to wind itself upon the roll 8 it is stripped from the periphery of the roll by the scraper 13 and thereafter collects in the hood 14. When this occurs, the hood may be readily thrown to open position, indicated in dotted lines in Fig. 7, by manipulating the end 18 of the shaft 16. In open position the interior of the hood is readily accessible for the removal of the broken portions of the paper web and such portions are prevented from entering the conduit 21 by the screen 20. After the removal of the paper from the hood the device may be quickly returned to operating position without shutting down the operation of the drier. It has been found that when the web breaks it is sometimes delivered against the hood with sufficient force to automatically throw the same to open position.

The screen 19 further facilitates the practical operation of the machine by confining the broken portion of the paper web to the accessible end of the hood in cases where the break occurs when the paper web is being "tailed" into the drier. Thus, as is well known in this art, it is common practice when starting the driers to cut the end of the web upon an oblique line to form a tail or relatively narrow projection near the accessible side of the machine. When this projecting tail breaks and passes into the hood 14 it is confined by the screen 19 in the end of the hood 14 where it can be most readily removed. The screens 19 and 20 are designed to permit the free passage therethrough of the particles of fibre, sizing and the like, removed from the drying roll 8, but larger portions of the paper web are caught by these screens and

prevented from obstructing or entering the conduit 21 and hose 22. Obviously when the scraper and cleaning device are not required they may be readily swung out of the way by pivoting the casting 12 in its supporting bearings 11. By operating the screws 31 and 32 the intake opening in the hood 14 along the working edge of the scraper 13 may be adjusted to give the desired draft of air.

Having described my invention what I claim is new and desire to protect by Letters Patent is:

1. In a cleaner for paper driers, the combination with a scraper extending longitudinally of a drying roll in engagement with the periphery thereof for freeing adhering particles from the peripheral surface of said roll, of a hood capping the edge of said scraper in contact with said roll for collecting loose particles freed by said scraper and a conduit for removing the particles collected in said hood.

2. In a cleaner for paper driers, a scraper extending longitudinally of a drying roll in engagement with the periphery thereof for freeing adhering particles from the peripheral surface of said roll, a hood extending longitudinally of said scraper adjacent to the edge of the same in contact with said roll for collecting loose particles freed by said scraper, said hood having an intake opening for a draft of air adjacent to the line of contact between said roll and scraper and a conduit adapted to be connected to suction means for removing the particles collected in said hood.

3. In a cleaner for paper driers, the combination with a scraper extending longitudinally of a drying roll in engagement with the periphery thereof for freeing adhering particles from the peripheral surface of said roll, of a hood covering the outer surface of said scraper in spaced relation thereto for collecting loose particles removed thereby and an air conduit connected to said hood for removing said particles therefrom.

4. The cleaner specified in claim 2 in which said hood is pivoted upon an axis substantially parallel to the drying roll and means are provided for pivoting said hood to adjust the effective size of said intake opening.

5. The cleaner specified in claim 1 in which said hood is readily removable from said scraper and provided with a side normally open when removed from said scraper.

6. The cleaner specified in claim 3 in which said hood is pivoted upon an axis substantially parallel to the drying roll for movement to open position and formed with a longitudinal opening adapted to permit the removal of paper web from the interior thereof when said hood is in open position.

7. The cleaner specified in claim 3 in which a screen is disposed within said hood to prevent the passage of portions of the paper web into said conduit.

8. The cleaner specified in claim 1 in which said conduit communicates with one end of said hood and said hood is removable from said scraper independently of said conduit.

9. The cleaner specified in claim 3 in which said hood is pivotally connected to said scraper and tiltable upon a longitudinal axis whereby said hood may be tilted away from said scraper and said hood is formed with a side normally open when tilted away from said scraper.

10. The cleaner specified in claim 3 in which said hood completely covers the working edge of said scraper and projects beyond the same in close proximity to the periphery of said drying roll and adjustable means for maintaining said hood in spaced relation to the periphery of said roll.

In testimony whereof, I have hereunto signed my name to this specification.

ARTHUR E. BROUGHTON.