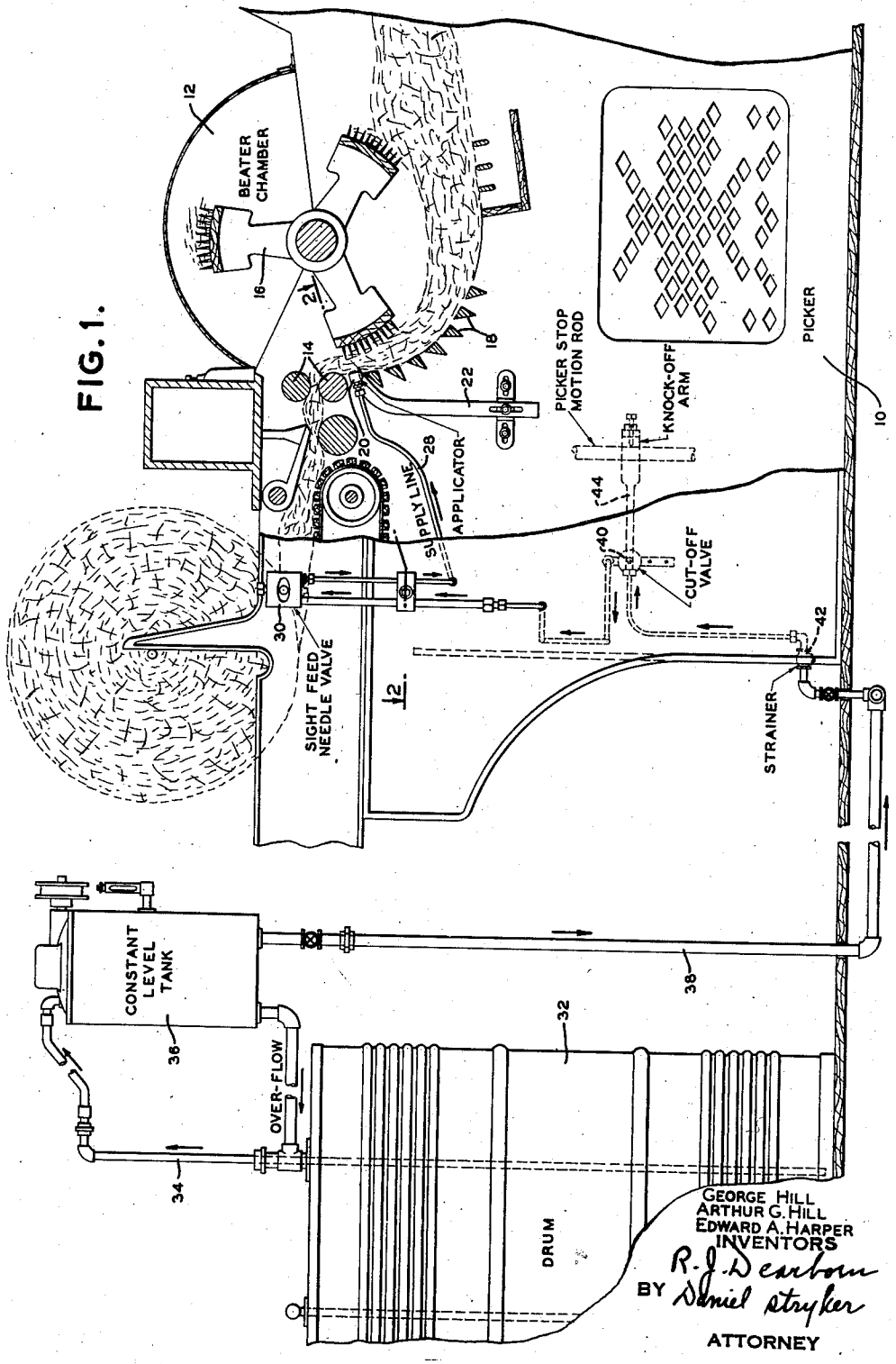
Jan. 21, 1941. G. HILL ET AL 2,229,566

METHOD AND APPARATUS FOR CONDITIONING FIBROUS MATERIAL

Filed May 14, 1938 2 Sheets-Sheet 1

FIG. 1.



GEORGE HILL
ARTHUR G. HILL
EDWARD A. HARPER
INVENTORS

BY R. J. Dearborn
Daniel Stryker

ATTORNEY

Jan. 21, 1941. G. HILL ET AL 2,229,566

METHOD AND APPARATUS FOR CONDITIONING FIBROUS MATERIAL

Filed May 14, 1938 2 Sheets-Sheet 2

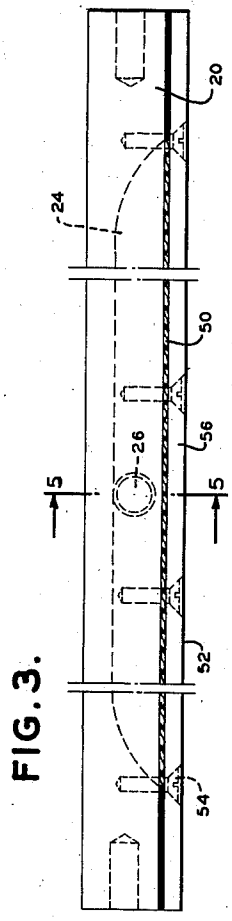


FIG. 3.

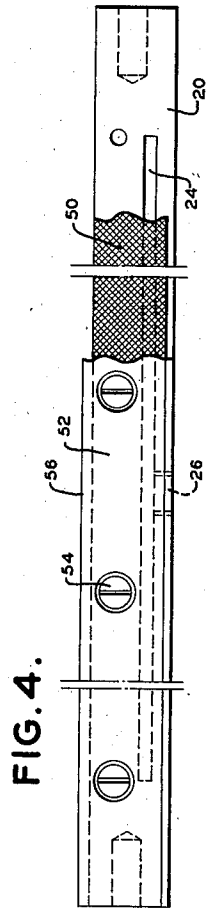


FIG. 4.

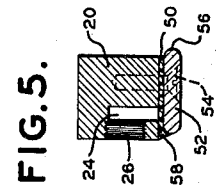


FIG. 5.

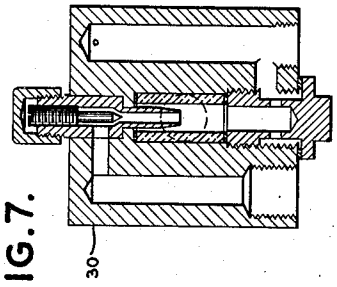


FIG. 7.

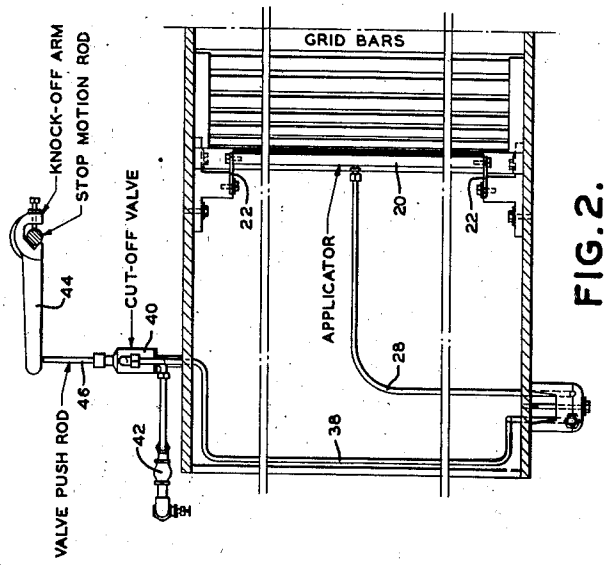


FIG. 2.

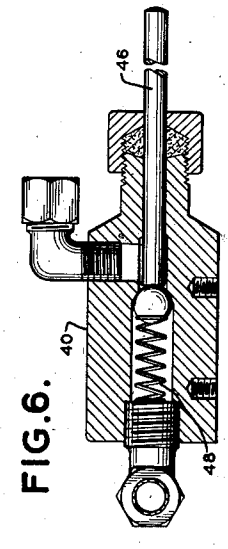


FIG. 6.

GEORGE HILL
ARTHUR G. HILL
EDWARD A. HARPER
INVENTORS
BY R. J. Dearborn
Daniel Stryker
ATTORNEY

Patented Jan. 21, 1941 2,229,566

UNITED STATES PATENT OFFICE

2,229,566

METHOD AND APPARATUS FOR CONDITIONING FIBROUS MATERIAL

George Hill and Arthur G. Hill, Wellford, S. C., and Edward A. Harper, Atlanta, Ga., assignors to The Texas Company, New York, N. Y., a corporation of Delaware

Application May 14, 1938, Serial No. 207,872

4 Claims. (Cl. 19—66)

This invention relates to a method and an apparatus for treating raw cotton and other fibrous materials such, for example, as wool, rayon, jute, hemp and the like, prior to the carding of such materials. During certain stages in the processing of fibrous materials such as raw cotton it is frequently desirable, if not actually necessary, to treat the fibers with a conditioning fluid in order to facilitate the working of the stock in the carding and subsequent spinning operations. This conditioning fluid may be of any type or character and may take the form of a straight mineral oil or an oil compounded in such a manner as to increase its ability to penetrate the fibers. For the sake of simplicity, but not by way of limitation, reference will hereinafter be made to "oil" in referring to the conditioning fluid, but it will be understood that the word "oil" as so used may refer to any kind of conditioning fluid.

The objects, to state only a few, of treating the fibers with oil are to render them supple, to prevent undue loss of fibers, and to prevent, or at least to minimize, the accumulation of static electricity during the carding, drawing and spinning operations. Heretofore various methods and types of apparatus have been employed for conditioning fibrous materials, and as illustrative of these methods and various types of apparatus reference is here made to United States Patent No. 1,973,761, granted to George Hill on September 18, 1934. According to the aforesaid Hill invention, the individual fibers are separated from their customary mass-like form as they enter a beater chamber and are sprayed with finely atomized oil at the point of separation in order to wet the individual fibers.

One of the objects of the present invention is to provide an apparatus capable of applying the oil to the fibers as they are separated from their lap-like form in a beater chamber to insure distribution of oil under completely controlled conditions, but without the necessity for atomizing the oil as is the case in the aforementioned Hill invention. In other words, the practice of the present invention obtains distribution of the oil by intimate contact with the fibers under conditions of wiping, speed and pressure and eliminates the need for compressed air to atomize the oil, this being a distinct advantage in most mills. According to the present invention, the oil is supplied by gravity from a tank in which the oil is maintained at a constant level to the point of application to the fibers.

Another object of the invention is to provide what will be termed, for want of a better name, an "applicator" of a length substantially the same as the width of the fiber lap and to which oil is supplied in regulated quantities to maintain it in a wet condition. The fibers which are separated from the advancing forward end of the lap by the action of the rotating beater in the beater chamber are wiped against the face of the applicator as they are carried around by the beater to transfer the oil from the applicator to the fibers by intimate contact.

The above and other objects, features and advantages of the invention will more fully appear from the following description when considered in connection with the drawings, wherein

Fig. 1 is a view in side elevation, partly in section, through a beater section of a picker of conventional form showing a typical installation of an applicator of the type embodied in the invention herein to be described, in the beater chamber of the picker,

Fig. 2 is a sectional plan view taken on the line 2—2 of Fig. 1 and shows the applicator in position in the grid section of the beater chamber,

Fig. 3 is a front view, considerably enlarged, of the applicator shown in Fig. 1,

Fig. 4 is an enlarged bottom view, partially in section, of the applicator,

Fig. 5 is a sectional view of the feed bar taken on the line 5—5 of Fig. 3,

Fig. 6 is an enlarged sectional view of a cut-off valve for controlling the flow of oil in timed relation with the operation of the picker, and

Fig. 7 is a view in cross section of a sight feed needle valve for vernier regulation of the supply of oil to the applicator.

Referring to the drawings, there is illustrated an apparatus which is particularly adapted for treating fibrous material such as cotton, wool, jute, hemp and the like, with oil in order to facilitate the working of the stock. The apparatus shown in Fig. 1 includes a picker indicated generally by the reference numeral 10. The picker, which is of conventional design, includes a beater chamber 12 wherein cotton or other fibrous material, which is introduced into the chamber 12 in lap-like form through feed rolls 14, 14, is acted upon by a revolving beater 16. A grid section provided with a plurality of grid bars 18 is positioned in the lower portion of the beater chamber. Dust and motes separated from the cotton or other fibrous material by the action of the beater 16 pass from the chamber 12 through the grid bars 18 and are subsequently removed.

Oil is applied to the cotton substantially at the point of its entry into the beater chamber 12 and in the apparatus illustrated an elongated applicator 20 is shown in position beneath the bottom feed roll 14 and placed well forward so that it lies along the arc formed by the grid section. The top grid bar 18 is preferably removed from the usual assembly to provide sufficient space for convenient insertion of the applicator 20, which then takes the place of and serves the same purpose as did the bar which has been removed. It is maintained in the desired position by any suitable securing means, such, for example, as brackets 22, 22, fastened to the sides of the beater chamber 12. The oil may, of course, be applied at any other convenient or desired point within the beater chamber of the picker or cleaning machine mechanism as, for example, in the place of the lowermost grid bar 18 instead of upper grid bar, as shown.

The applicator 20 is substantially square in cross section and is provided with a relatively deep slot 24 which extends throughout a greater portion of its length. An oil duct 26 extends from the slot 24 through the rear wall of the applicator 20 and is connected by means of an oil supply line 28 to a sight feed needle valve 30 by means of which minute regulation of the flow of oil to the applicator is maintained.

Oil is supplied to the sight feed needle valve 30 from a main source of supply which may consist of interchangeable oil drums 32. A pipe 34 extends from the drum 32 to and through a constant level tank 36 where the hydrostatic head is maintained at a predetermined level. From the tank 36 the oil passes by gravity through a pipe 38 having a cut-off valve 40 to the sight feed valve 30. This pipe 38 may also include a strainer 42 for removing foreign matter from the oil. Oil is permitted to flow to the applicator only when the feed mechanism of the picker is in operation, the cut-off valve 40 being operated in conjunction with the feed mechanism through a knock-off arm 44 which is affixed to some moving part of the feed mechanism and actuates the valve push rod 46 to open the valve in response to the movement of the feed mechanism, it being closed by the expansion of a spring 48 contained within the valve body when the pressure is released on the push rod 46.

Oil is applied to the fibers in the beater chamber substantially at the point of their entry into the beater chamber 12 and as the individual fibers are separated from the advancing forward end of the lap by the action of the beater 16. The rotating beater acts upon the fibers across the entire width of the lap as it is delivered into the beater chamber 12 by the feed rolls 14 and causes them to pass in wiping engagement against the oil wetted applicator. To apply the oil evenly a porous material such as fabricated metal or felt 50 is secured to the applicator 20 to cover the exposed portion of the slot 24 as shown in Figs. 3, 4 and 5. The porous material 50 is held in position by a retaining plate 52 which, in turn, is held in position by means of screws 54 which pass therethrough and through the porous material and are anchored in the body portion of the applicator. The forward edge of the retaining plate 52 extends slightly beyond the front face of the applicator and forms a lip 56 which is maintained in a wetted condition with oil which seeps from the slot 24 through the porous material 50 and is diffused across the lip 56 of the retaining plate 52.

From the foregoing it will be seen that in the type of construction shown in Figs. 3, 4 and 5 the porous material 50 covering the slot 24 acts as a distributing medium for the oil which is supplied to the applicator through the duct 26. The exposed portion of porous material opposite the lip 56 is sealed, preferably with solder as at 58 in Fig. 5, to prevent seepage of oil in that direction. It is apparent that the applicator 20 is so adjusted with respect to the beater 16 that as the latter separates the individual fibers from the forward end of the lap as it emerges from between the feed rolls 14 they are caused to pass in a direction perpendicular to the axis of the applicator and in wiping engagement with the oil-wetted surface of the applicator 20 from which the oil is transferred to the fibers.

While the present invention has been described above as applied particularly to a down-stroke beater of a picker, it is equally applicable to a picker with an up-stroke beater. It may also be applied to the lickerin of a carding machine or to the doffer of a carding machine. The principle of operation embodied in the two last mentioned applications is identical with that of an application in the beater chamber of a picker in that in both instances the fibers are wiped across the feed face of the feed bar and oil from the feed bar is thereby transferred to the fibers.

Obviously, many modifications and variations of the invention as herein described may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. The combination with a beater chamber having feed rolls and a revolving beater for acting upon the fibrous material passing into the chamber between the feed rolls, of a slotted applicator inserted in the grid section of said chamber in place of one of the plurality of grid bars ordinarily employed, means for supplying oil in regulated quantities to the slot in said applicator, and porous means covering said slot but permitting seepage of oil therefrom to maintain one face of the applicator wet with oil from which face oil is transferred to the fibers as they are caused by the beater to pass in wiping engagement therewith.

2. The combination with a beater chamber having feed rolls and a revolving beater for acting upon fibrous material passing into the chamber between the feed rolls, of an applicator disposed below the bottom feed roll and comprising an elongated member slotted throughout the greater portion of its length and formed with a duct through which oil enters to fill said slot, porous material covering the exposed portion of the slot, and a plate secured to the applicator for retaining said porous material in position, the forward edge of said plate extending beyond the front face of the applicator to form a lip over which oil seeping through the porous material is diffused, and means for continuously supplying oil to the duct in said applicator so that the porous material in the applicator is constantly maintained wet with oil for transfer to the fibers as they are caused by the revolving beater to pass in wiping engagement therewith.

3. In apparatus for treating textile fibers, a beater chamber having a grid section and an opening through which fibers enter the beater chamber in lap-like form, a rotatable beater having blades of a length substantially the same as

the width of the beater chamber mounted in said chamber and adapted to act upon the entire width of the advancing forward end of the lap to separate individual fibers from the lap-like mass, an applicator interposed in the grid section of the beater chamber having one face adapted to be maintained moist with a conditioning fluid and being of a length substantially the same as the width of the fiber lap, and means for rotating said beater to pass the separated fibers against said moistened face of the applicator in a direction perpendicular to the axis of the applicator for transferring conditioning fluid from the applicator to the separated fibers.

4. In apparatus for treating textile fibers, a beater chamber having a grid section and an opening through which fibers enter the beater chamber in lap-like form, a rotatable beater having blades of a length substantially the same as the width of the beater chamber mounted in said chamber and adapted to act upon the entire width of the advancing forward end of the lap to separate individual fibers from the lap-like mass, an applicator interposed in the grid section of the beater chamber having one face adapted to be maintained moist with a conditioning fluid and being of a length substantially the same as the width of the fiber lap, means for rotating said beater to pass the separated fibers against said moistened face of the applicator in a direction perpendicular to the axis of the applicator for transferring conditioning fluid from the applicator to the separated fibers, and means for constantly maintaining the face of the applicator moist with the conditioning fluid.

GEORGE HILL.
ARTHUR G. HILL.
EDWARD A. HARPER.