

May 1, 1945.

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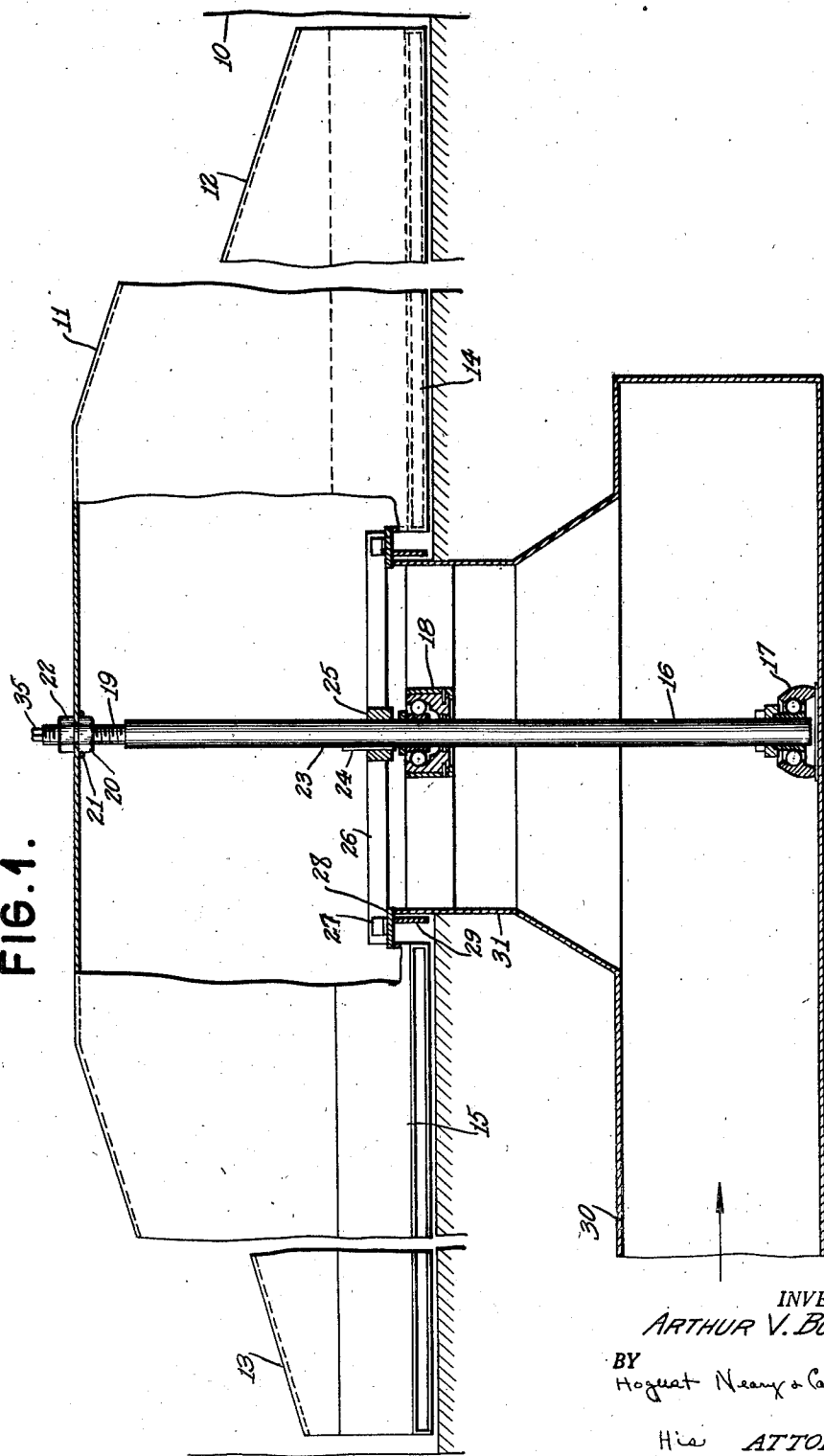
2,374,977

FLOOR SWEEPER

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2 Sheets-Sheet 1

FIG. 1.



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2 Sheets-Sheet 2

FIG. 2.

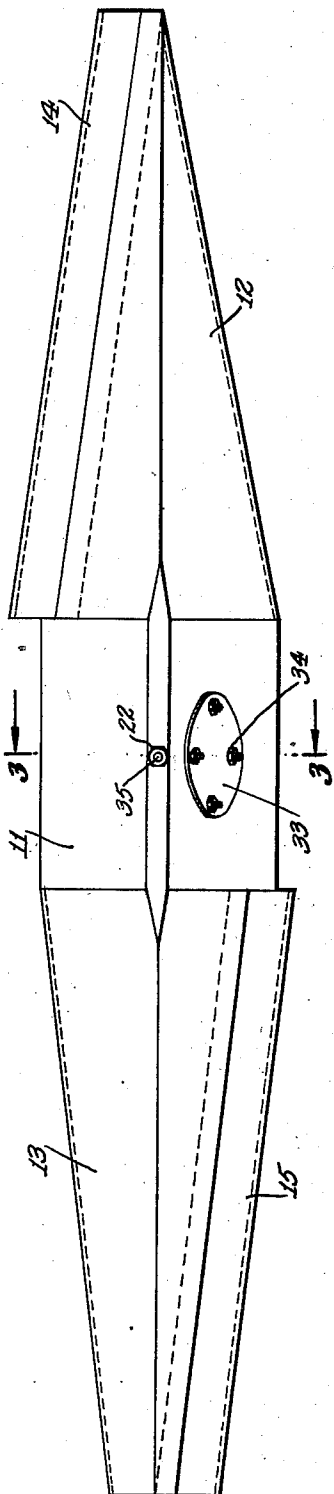


FIG. 4.

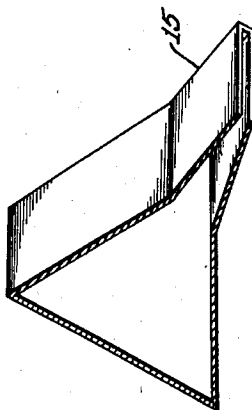
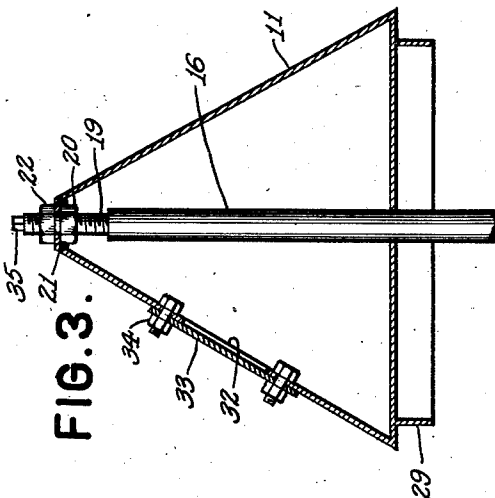


FIG. 3.



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UNITED STATES PATENT OFFICE

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FLOOR SWEEPER

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3 Claims. (Cl. 15—20)

This invention relates to an improvement in floor sweepers, for use in spray drying equipment of the general type described in the patent to Bowen No. 1,946,566, whereby spray dried material can be more effectively collected from the floor of the drying chamber.

The floor sweepers at present in use are characterized by the fact that they are not adjustable as to height relative to the floor of the drying chamber. The present invention provides certain novel means whereby this desirable characteristic of adjustability may be achieved.

In addition, the present invention provides an improved construction of floor-sweeper nozzle which acts with superior efficiency over those heretofore employed.

Further objects of the invention will become apparent as it is described in greater detail in connection with the accompanying drawings, in which:

Fig. 1 is a view in front elevation, partly broken away and in section to illustrate the interior of a floor sweeper constructed in accordance with the present invention;

Fig. 2 is a plan view of the sweeper shown in Fig. 1;

Fig. 3 is a view in section taken on line 3—3 of Fig. 2 and looking in the direction of the arrows; and

Fig. 4 is a perspective view of the end portion of one arm of the floor sweeper illustrated in Figs. 1 and 2.

Referring to Fig. 1 of the drawings, the numeral 10 indicates the bottom portion of a spray drying chamber in which the floor sweeper is mounted. The floor sweeper consists principally of an elongated hollow shell, formed with oppositely extending arms 12 and 13. The arms 12 and 13 are provided respectively with nozzles 14 and 15. It will be seen that nozzles 14 and 15 extend in opposite directions. Each nozzle 14 and 15 preferably extends the full length of the arm of the sweeper to which it is attached.

The sweeper is mounted upon a spindle 16 which is journaled in anti-friction bearings 17 and 18 and threaded at its upper end 19. The shell 11 is mounted upon the threaded portion 19 by means of a nut 20 which is welded to the floor sweeper shell at 21. A lock nut 22 serves to hold the sweeper firmly in place.

If desired, the spindle 16 may have a keyway 23 cut therein to receive a key 24 which may be in engagement with a collar 25 secured to the hollow shell 11 by straps 26. The straps 26

have angles 27 welded thereto, which angles 27 are affixed to the hollow shell 11 at 28.

The hollow shell 11 is further provided with a flange 29 which serves as a baffle to inhibit the escape of air from the hollow shell 11.

In operation, air enters through the air duct 30 below the floor of the drying chamber and passes upwardly through a vertical duct 31 and the straps 26. The air then is forced out through the nozzles 14 and 15 and performs its sweeping action upon the spray dried particles that have fallen to the floor of the drying chamber 10.

Figs. 2 and 3 of the drawings further indicate the positioning of an orifice 32, shown in the preferred embodiment as closed by cover plate 33 and held in place by means of bolts 34.

When it is desired to raise the height of the floor sweeper relative to the floor of the drying chamber 10, the key 24 is removed (access being provided through aperture 32) and the lock nut 22 is backed away from the shell 11. Thereafter, the floor sweeper shell 11, together with the nut 20, are rotated upon the threaded portion 19 of spindle 16 until the desired height is attained. The lock nut 22 is then again tightened upon the shell 11 and the key 24 is replaced thus precluding any further movement of the shell upon the spindle 16.

Alternatively, the threaded portion 19 of the spindle 16 may terminate in a square end 35. In this case adjustment of the height of the sweeper may be achieved after removal of the key 24 by loosening the lock nut 22 and turning the spindle by means of the squared end 35.

The invention provides an improved floor sweeper which is capable of adjustment as to height relative to the floor of the spray drying chamber in which it is mounted, thus permitting an increase or decrease of velocity of the air issuing from the floor sweeper without the necessity of changing the amount or velocity of the air entering the intake duct. It further provides, by means of the improved nozzle, the delivery of a uniform and continuous current of air to all parts of the floor of the spray drying chamber whereby greater efficiency of collection of the spray dried particles is achieved.

It will be evident that numerous changes in form and detail are possible within the scope of the invention and although a specific embodiment has been described above, it is not intended to be limited in any way thereby, except as defined in the following claims.

I claim:

1. A floor sweeper for use in spray drying ap-

paratus comprising an elongated shell adapted to be positioned in the lower portion of a spray drying chamber, a spindle rotatably mounted in the said lower portion of said spray drying chamber, bearing means for supporting said spindle rotatably and in an upright position, means positioned centrally of the top of said shell for engaging said spindle and adjusting said shell axially of said spindle, means in the lower portion of said shell for engaging said spindle, cooperating means on said spindle and said means in the lower portion of said shell for locking said shell to said spindle in adjusted position, and means for introducing a fluid into said shell.

2. A floor sweeper for use in spray drying apparatus comprising an elongated shell adapted to be positioned in the lower portion of a spray drying chamber having a plurality of oppositely disposed arms, each having a laterally and downwardly directed fluid discharge slot extending lengthwise of said arm in the lower side portion thereof, said slots being in corresponding positions in said arms to cause rotation of said shell by reaction, a spindle rotatably mounted in the said lower portion of said spray drying chamber, said spindle having a threaded portion at one end thereof, bearing means for supporting said spindle rotatably and in an upright position with the threaded portion disposed upwardly, means for adjusting said shell axially of said threaded

portion of said spindle, locking means to secure said shell against rotation relative to said spindle, and means for introducing a fluid into said shell.

3. A floor sweeper for use in spray drying apparatus comprising an elongated shell adapted to be positioned in the lower portion of a spray drying chamber having a plurality of oppositely disposed arms, each having at least one laterally and downwardly directed discharge slot extending lengthwise of a side portion thereof, a spindle rotatably mounted in the said lower portion of said spray drying chamber, said spindle having a threaded portion at one end thereof, bearing means for supporting said spindle rotatably and in an upright position with the threaded portion disposed upwardly, means at the top of said shell for engaging and adjusting said shell axially of the threaded portion of said spindle, a central opening in the bottom of said shell, means extending across said opening and engaging said spindle to support said shell on said spindle, cooperating locking means on said spindle and said shell supporting means to secure said shell against rotation relative to said spindle, conduit means extending into said opening and spaced from said shell for introducing a fluid through said opening into said shell, and sealing means between said conduit means and said shell.

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