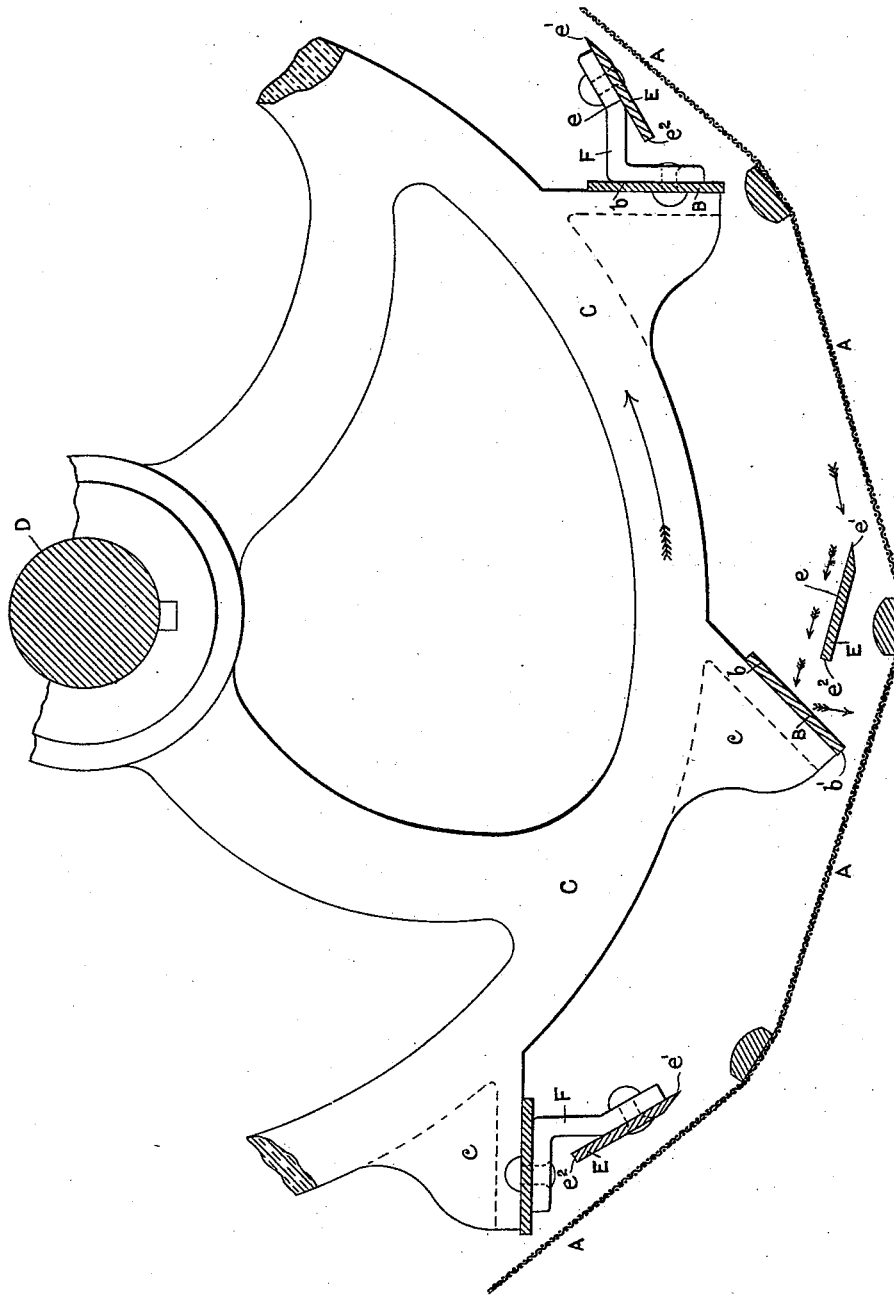


(No Model.)

J. HIGGINBOTTOM.
CENTRIFUGAL DRESSING MACHINE.

No. 490,652.

Patented Jan. 31, 1893.



Witnesses
J. Stanley Elmore.
W. R. Kennedy

Inventor
James. Higginsbottom
By his atty P. T. Dodge

UNITED STATES PATENT OFFICE.

JAMES HIGGINBOTTOM, OF LIVERPOOL, ENGLAND.

CENTRIFUGAL DRESSING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 490,652, dated January 31, 1893.

Application filed July 23, 1890. Serial No. 359,610. (No model.) Patented in England April 13, 1889, No. 6,370.

To all whom it may concern:

Be it known that I, JAMES HIGGINBOTTOM, milling engineer, a subject of the Queen of Great Britain, residing at Liverpool, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in Centrifugal Dressing-Machines, (for which I have received Letters Patent in England, dated April 13, 1889, No. 6,370,) of which the following is a specification.

This invention relates to centrifugal separating or dressing machines, and more especially to the machines of this description such as are now commonly used for the separating or dressing of flour, middlings, semolina, grain, seeds or other dry granular or pulverulent material, the object of the invention being to so improve the revolving beating devices of such machines that the material under operation may be separated or dressed more rapidly and thoroughly than heretofore.

The drawing, which is a transverse section of a portion of an ordinary dressing machine, shows how my invention may be applied to machines of this description.

These machines, as at present employed, consist essentially of a cylindrical or polygonal casing A of wire or silk gauze, or the like, which is generally placed horizontally and revolves at a comparatively slow rate, being provided internally with a series of rapidly revolving beaters B. The latter are attached, as by lugs c, to suitable carriers C which are mounted on a shaft D, whose axis is concentric with that of the casing. The carriers and their shaft revolve in the direction shown by the large arrow, while the casing may revolve in either direction, but preferably in the same direction as that of the carriers, but at a much slower speed. The beaters B are usually flat blades, as shown, fixed preferably (as regards their length) at an angle to the axis of the cylinder, and with their beating surfaces b set at an angle to a line drawn tangentially to the casing for the purpose of driving the material to be dressed against the inside of the gauze covering of the casing, in such manner that the small particles of material may be driven through the meshes of the gauze, and the large particles completely denuded of small adhering particles, as is well understood by millers. The casing

is usually provided at one end with a suitable feed orifice, and at the other end with a suitable discharge orifice to allow the large particles to escape.

Now I have found that with beaters like those above described, the dressing of the material is performed very unequally over the different portions of the casing's periphery. Thus, the amount of dressing performed at the bottom and sides of the casing is different from that performed at those parts of the casing where the particles tend to descend or fall away from the inner surface of the casing by the action of gravity. This difference in dressing is mainly due to the fact that the material, owing to gravity and the centrifugal force of the air in the casing, has a tendency to form a layer against the bottom and sides of the casing, and, at some portions of these parts, the material comes very little under the direct striking action of the beaters. As the material, however, is carried round to the top of the casing, its tendency is to fall inward toward the beaters, and these latter throw it back again against the casing, from which it again falls or rebounds, and is again thrown back, and so on, in varying degree until the bottom of the casing is again reached. The increased beating action in the upper portion of the casing is thus due to the fact that the particles are repeatedly thrown backward and forward between the beaters and the casing by the combined action of gravity and the direct impact of the beaters. Now, by my invention, I purpose to increase this direct beating action, and to extend it to those parts of the casing in which it has heretofore been more or less inoperative.

In carrying my invention into effect, I mount a suitable deflecting strip or plate E on the forward face b of one or more or all of the beaters B, preferably extending the entire length thereof. The plates E may be supported upon the beaters by suitable brackets or angle cleats F placed at convenient intervals, say about eighteen inches apart, when dressing flour. The forward edge e' of each deflecting plate is, by preference, so located that it travels approximately in the same circular path as, or a little outside of the circular path of, the outer edge b' of the beater. The rear edge e² of each deflecting plate is located at a greater distance from the surface

of the casing than the front edge e' of the said plate and, by preference, of the outer edge b' of its respective beater. The forward edge of each plate E is, by preference, beveled as shown. The inner or forward face e of each deflecting plate E is thus inclined at an angle to the forward face b of its beater, and the rear edge e^2 of the deflecting plate is placed at a suitable distance from the said forward face b so that the narrow end of the trough shaped space between the two forward faces e and b opens out toward the surface of the casing, A, as shown.

As the beaters B revolve, particles, which would otherwise have been prevented from coming into direct contact with the beaters are caught up by one or more of the deflecting plates E—the forward narrow edges of which are some distance in front of the faces b of their respective beaters, and offer little resistance in passing through the air—and the said particles are forced, by the rapid motion of the deflecting plates through the air, to travel along their inner or forward faces e . On reaching the openings at the rear edge e^2 of each plate, such particles are thrown by centrifugal force (being also assisted, it may be, by gravity) toward the surface of the casing, but, before they have time to get clear out of the path of the corresponding beater, they are caught by the latter and hurled against the said surface, with greater force than would have been the case had the deflecting plate E not been used. The above action will be readily understood by means of the small arrows. This action is continually repeated, and the total quantity of the particles hurled against the surface of the casing by the direct impact of the beaters is greater than would have been the case had a deflecting plate or plates not been used.

By this invention, I obviate, to a great extent, the tendency which the action of the ordinary beaters (combined with that of gravity) has to cause the material to accumulate on the sides and lower portions of the casing, as the improved beater B E will pick up any particles hovering at a short distance from the surface of the casing, and, having picked them up, it will hurl them with an accelerated velocity toward said surface. The increased number of the impacts between the beaters B and the particles will also have the effect of producing a more rapid dressing or separation of the material under treatment all over the casing surface. I shall thus be enabled to use a finer gauze covering on the casing, while dressing a given amount of material in the same time as heretofore, or to use the same covering and to dress a greater amount in the same time.

The beaters B and deflecting plates E may be of any suitable material according to circumstances. When separating flour, I prefer, however, to make them of steel plate about one-sixteenth of an inch thick, and of a width and length suitable to the diameter

and length of the casing. Their exact proportions will depend very much upon the character of the work which they are to perform, and can only be accurately determined by actual experiment. When applying this invention to the treating of grain or seeds, such as wheat, barley, oats, rice or clover for the purpose of separating small refuse and thereby more effectually cleaning the grain or seeds, I make the casing of coarser and stronger mesh and the beaters of stronger material to suit the grain or seeds under treatment. The beaters B, are, by preference, placed at such an angle that the material is thrown off them in lines approximately perpendicular to the surface of the casing. Both the beaters B and deflecting plates E may be formed, either in single lengths extending the entire length of the casing, or in two or more lengths placed end to end. These successive lengths may be in line one with the other, or they may lie at different angles to the axis of the casing.

I declare that what I claim is:—

1. In a centrifugal separating or dressing machine, the combination with the pervious cylinder or casing of a series of longitudinal spreader blades mounted on a rotary support and inclining backward and outward, and a series of deflecting blades supported in front of the spreader blades and inclining backward and inward with open spaces between the deflectors and spreaders, whereby the material is first gathered and deflected inward against the spreaders and then thrown outward by the latter.

2. In combination with the casing A and beater B, the deflecting plate E mounted on the face of said beater and having its forward edge moving in approximately the same path as the outer edge of the beater and its rear edge located at a suitable distance from the said beater face and moving in a path nearer the center of rotation than that of its forward edge, substantially as described.

3. In a centrifugal separating or dressing machine, the combination with the pervious cylinder or casing of a longitudinal rotary shaft within the same, a series of longitudinal spreaders supported from said shaft in proximity to the casing, and inclining backward and outward, and a series of longitudinal deflecting blades supported in front of the spreaders and inclining backward and inward with open spaces between the said deflectors and spreaders, the front faces of the deflectors standing in planes inclined to the front faces of the beaters and passing through the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES HIGGINBOTTOM.

Witnesses:

LLEWELYN JONES,
JOHN HAYES.