

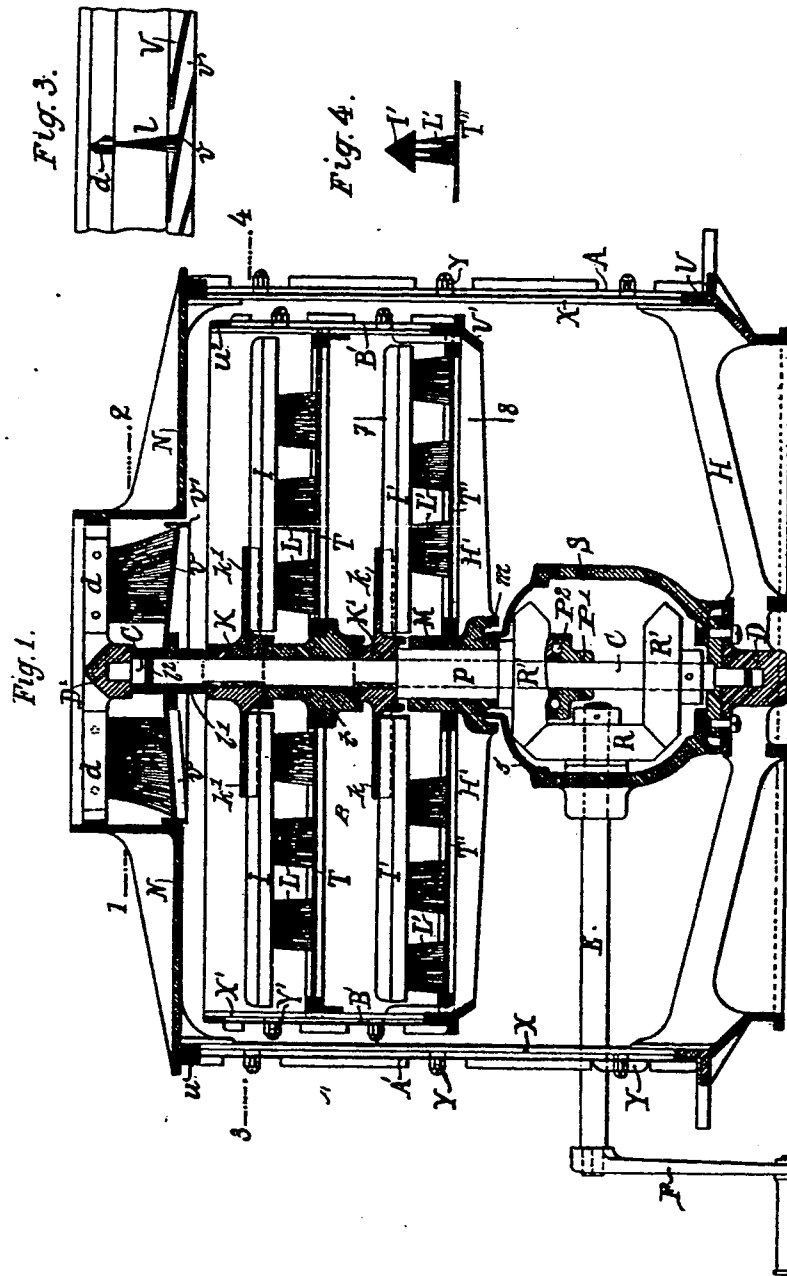
(No Model.)

2 Sheets—Sheet 1.

A. F. DARRAS.
FLOUR SIFTER.

No. 566,144.

Patented Aug. 18, 1896.



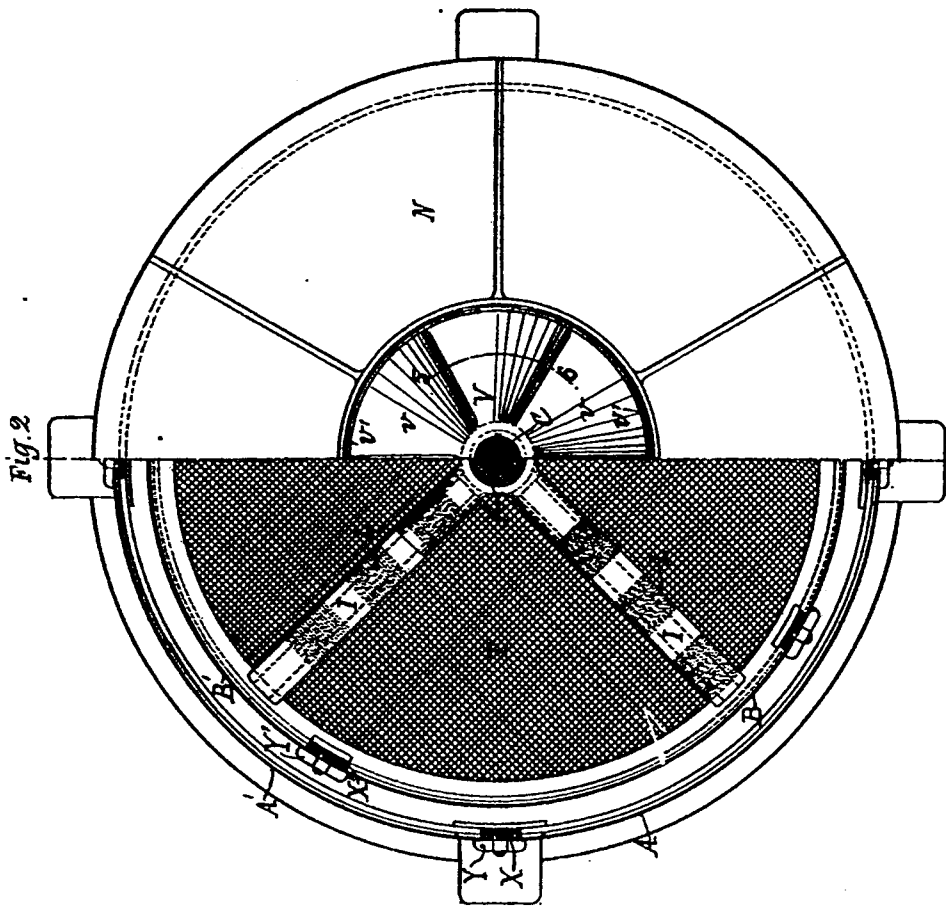
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WITNESSES
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UNITED STATES PATENT OFFICE.

AUGUSTE FERNAND DARRAS, OF PARIS, FRANCE.

FLOUR-SIFTER.

SPECIFICATION forming part of Letters Patent No. 566,144, dated August 18, 1896.

Application filed April 23, 1895. Serial No. 546,934. (No model.) Patented in France October 1, 1894, No. 241,751.

To all whom it may concern:

Be it known that I, AUGUSTE FERNAND DARRAS, a citizen of the Republic of France, residing in Paris, France, have invented a Flour-Sifter, (for which I have obtained a French patent, No. 241,751, dated October 1, 1894,) of which the following is a specification.

This invention relates to a machine for cleaning, sifting, and separating flour and other mealy substances, and more especially to effect in meal used for the purposes of making bread, pastry, and biscuits the opening of the cellulose lumps of grain in the mass, with the object of freeing the maximum of nutritious substances contained therein.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 represents a vertical section of a machine constructed after the manner of my invention. Fig. 2 is a sectional plan view of the same. Figs. 3 and 4 are detail sections.

The reference-letter V indicates an annular metallic rim with which the radial arms II are formed integral, and said radial arms II have at their inner ends and axially coincident to the rim V a step-bearing D. Rising vertically from the rim V and parallel with each other are the standards X, which are preferably four in number and which have their upper ends rigidly secured to the cap or top portion N. This cap or top portion is formed at its under edge with a downwardly-projecting flange which facilitates a connection with the standards X, and the central part of the cap N is formed with a concentric and circular opening having an upwardly-extending boss or tube surrounding the same, the walls of which are perpendicular to the cap.

A' indicates four flexible sheet-metal panels which are adapted to extend from one of the standards X to that adjacent and which form the sides of the casing inclosing the operative parts of my invention. These panels are arranged with their vertical edges in rabbets or rabbet-grooves formed in the standards X and are held therein by means of swinging latches or fastening devices Y. These fastening devices are mounted so as to swing and so that they may extend horizontally on the standards X or vertically therewith, and

when extended horizontally they will engage with the panels A' and hold the same secure. On the other hand, when extended vertically the panels will be released.

It will be observed that the rim V is formed with an open bottom, which makes the casing of the machine open and whereby the material acted on may be delivered from the casing into a receptacle below, which may be a kneading apparatus or any other device, according to the nature of the operation which is performed on the material.

Revolubly seated within the step-bearing D is a vertical shaft C, which has its upper end mounted in a bearing D', the said bearing D' being integral with the radial arms d, which extend across the tube or boss on the cap N and which have their outer ends rigidly secured to the interior sides thereof. Fixed on the shaft C is a miter-gear R', which meshes with a corresponding gear R, mounted on a horizontal shaft E, the same having bearings in the casing S and extending beyond the casing of the machine. The outer end of the shaft E is provided with a crank F or with any other suitable driving mechanism, all of which will be obvious.

The casing S is seated upon the step-bearing D and rigidly secured thereto by means of bolts or screws passing through the same and through flanges at the base of the casing. The casing S is provided to inclose the gears R and R' and other hereinafter-described parts of the machine and to prevent them from being clogged with grain.

P indicates a hollow shaft receiving the shaft C and rotatable thereon. This shaft has at its lower end a miter-gear which meshes with the gear R at the upper side of the latter and which is driven through the medium of the same.

P' indicates a collar which is rigid on the shaft C and which has formed in its upper side an annular groove carrying the balls P², which parts coöperate with an extension formed on the shaft P, whereby the said shaft is supported on the shaft C in a way which will make it capable of independent rotary movement.

Fixed on the shaft P is a collar M, which has integral therewith radial arms H, the same being extended to a point just inward

of the standards X and which have integral with their outer ends a rim V'. The collar M has an annular groove *m*, formed at its underside, which receives the upwardly-projecting end of the cap *s*, which forms a part of the casing S, and whereby the collar M is made free to rotate with the shaft P and yet have a connection with the casing S, which will exclude the passage of dust and other matter.

Rising vertically from the rim V' are the standards X', which are similar to the standards X and which project upwardly to a point just below the cap N'. These standards are also four in number, by preference, but this may obviously be varied and have formed in their outer sides rabbet-grooves or rabbets receiving the panels B'. The panels B' are four in number and form the curved sides of the drum, consisting of the radial arms H and standards X.

Y' indicates fastening devices similar to the devices Y and operating to removably hold the panels B'. Thus it will be seen that the shaft P has attached thereto a rotatable drum or casing, and this drum is provided to carry the sieves T and T'. The sieve T' is fixed on the sleeve M and is arranged at the lower portion of the casing, forming the bottom, while the sieve T is carried by a collar *t*, revolvably mounted on the shaft C, and the said sieve has its outer edge fixed to the interior sides of the drum. The sieve T is of a larger mesh than its companion, for a purpose that will be readily understood.

K' indicates a collar or sleeve which is keyed to the shaft C and which has at its lower end downwardly-projecting flanges embracing the upper end of the shaft P. The collar K has integral therewith radial arms *k*, which are recessed on their under sides and which have affixed in said recesses the arms I'. The arms I' are radially disposed in relation to the shaft C and project to a point just inward of the sides of the drum.

L' indicates a series of brushes which are fixed to the arms I' and which project downwardly therefrom and play over the surface of the sieve T'. Thus it will be seen that the sleeve *t* is supported by the collar K'.

K indicates a second collar, which is also keyed to the shaft C and which is rested upon the upper end of the sleeve *t*. This collar K has arms *k'* radiating therefrom, the said arms being counterparts of the arms *k* and having the rods or arms I affixed in the recesses at their under sides. These rods I project after the manner of the arms I' and have the brushes L affixed to their under side and projecting downwardly therefrom. The brushes L make contact with the sieve T, as the brushes L' are arranged with the sieve T'. Thus it will be seen that as the shaft E rotates the gears R' and R² will be moved in opposite directions, which will result in a differential rotation of the shafts P and C, causing the drum to rotate in one di-

rection, carrying with it the sieves T and T' and causing the arms I and I' to rotate in an opposite direction, the whole resulting in the movement of the sieves T and T' in a direction opposite to the movement of the brushes L and L'.

l indicates a sleeve which is fixed on the upper extremity of the shaft C and which is held in place by means of a key *l'*, passing through the shaft and sleeve. The sleeve *l* has a flange formed on its outer side which is annular in shape and which has the vanes *r* secured thereto. The vanes *r* are arranged with a shutter-like disposition, as illustrated in Fig. 3, and have their outer ends affixed to or formed integral with the annular rim *r'*. These vanes are arranged, as will be seen, to rotate with the shaft C, and they are located at the lower end of the tube or boss on the cap N and filling the interior size thereof.

l indicates a series of brushes which are fixed to the arms *l* and which project downwardly therefrom and engage with the vanes *r*. Fig. 3 illustrates the manner in which the brushes *l* engage with the vanes *r*, and as the said vanes rotate with the shaft C the brushes play over their surface and operate to distribute the grain which is introduced into the tube on the cap N. The function of the vanes *r* is to primarily receive the flour and to carry it into engagement with the stationary brushes *l*, which is effected by the rapid and continuous revolution of the vanes, and when the flour is thus carried to the brushes *l* they will retard its movement with the vanes and operate to distribute the flour evenly over said vanes, whereupon the flour will fall through the spaces between the vanes, assisted in so doing by the centrifugal influence attending their revolution. The construction of the brushes L and L' is also illustrated in Fig. 4. This is not of any special importance, however, since any suitable construction will carry out the purpose of my invention.

By reference to the drawings the operation of invention will be obvious. The material to be purified is introduced into the machine by way of the tube or boss on the cap N and falls upon the rotating vanes *r*, which, being revolved at a high speed, carry the material around and into engagement with the brushes L, and by these means the said material is evenly distributed through the spaces between the sieves and allowed to drop upon the sieve T and within the drum. As the flour engages with the sieve T it is acted on by the same and by the brushes L, which, being revolved rapidly in opposite directions, quickly force the finer particles of flour through the sieve T and upon the sieve T'. The sieve T' performs the same operation as the sieve T, and, being of a smaller mesh, effects a more thorough renovation of the flour, which finally falls through the lower ends of the drum and casing and into the receptacle below the latter.

By kneading flour treated as described it

becomes hydrated, so that its soluble contents readily dissolve in water, and the chemical combination of its constituents is far more complete than when the flour is not so evenly
 5 divided, and paste or bread made with it is much lighter and more nutritious and more digestible than that otherwise made.

Having thus described my invention, I claim as new and desire to secure by Letters
 10 Patent—

1. The combination with a casing, of a vertical solid shaft therein, a gear fixed to the shaft, a drive-shaft horizontal in the casing, a gear on the drive-shaft and meshing with the
 15 gear of the solid shaft, a collar revoluble on the solid shaft, a gear carried by the collar and meshing with the gear on the drive-shaft, an auxiliary casing inclosing the three gears and having at its upper end an annular and
 20 upwardly-projecting flange, the collar being formed with a downwardly-opening, annular groove receiving the flange of the auxiliary casing, a sieve carried by the sleeve on the hollow shaft, and a brush carried by the solid
 25 shaft, substantially as described.

2. The combination with a stationary casing, of a vertical shaft, a collar loose on the vertical shaft, means for oppositely driving said parts, radial arms fixed to the collar, an
 30 auxiliary casing carried by the radial arms and concentric to the shaft, sieves superposed in the auxiliary casing and revolving therewith, the sieves having loose connection with the shaft, and brushes fixed to the shaft and
 35 cooperating with the sieves, substantially as described.

3. The combination with a stationary casing, of a vertical shaft within said casing, an auxiliary casing embracing the vertical shaft
 40 and revolubly mounted thereon, means for

oppositely driving the auxiliary casing and the vertical shaft, sieves superposed within the auxiliary casing, loose collars embracing the shaft and respectively connected to sieves, and brushes fixed to the shaft and respectively
 45 cooperating with the sieves, substantially as described.

4. The combination with a stationary casing, of a vertical shaft, a series of collars embracing and superposed on the vertical shaft,
 50 alternate collars being fixed thereto, arms fixed to the lowest loose collar and projecting from the same, an auxiliary casing supported by said arms, a series of sieves superposed within and carried by the auxiliary casing,
 55 the sieves being respectively connected at their centers to the loose collars, brushes respectively fixed to the fixed collars and cooperating with the sieves and means for relatively driving the auxiliary casing and vertical
 60 shaft, substantially as described.

5. The combination with a stationary casing, of a vertical shaft, a collar loose on the vertical shaft, means for relatively driving said parts, radial arms fixed to the collar, an
 65 auxiliary casing carried by the radial arms and concentric to the shaft, a sieve carried by the auxiliary casing and revolving therewith, the sieve having a loose connection with the shaft, and a brush fixed to the shaft and co-
 70 operating with the sieve, substantially as described.

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

AUGUSTE FERNAND DARRAS.

Witnesses:

CHARLES JONES,

CLYDE SHROPSHIRE.