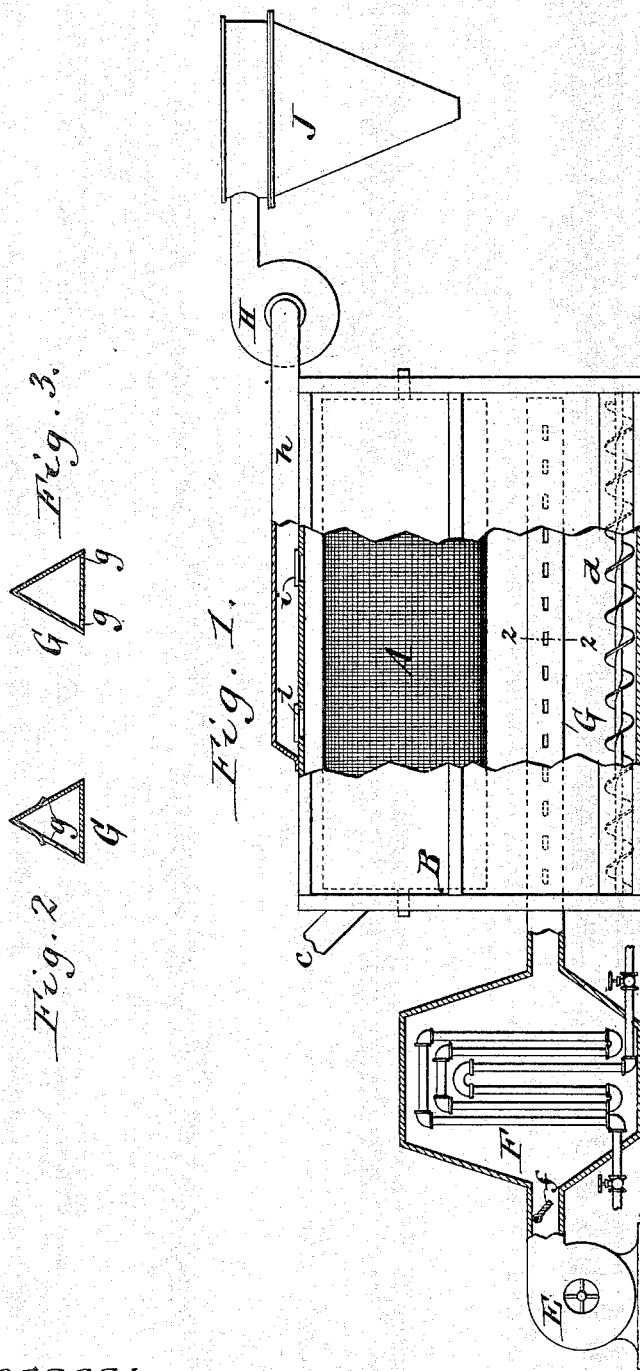


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Patented Apr. 17, 1900.

S. LEETHAM & H. SIMON.
APPARATUS FOR MANUFACTURING FLOUR
(Application filed Mar. 22, 1897.)

(No Model.)



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SIDNEY LEETHAM, OF HUNGATE, AND HENRY SIMON, OF MANCHESTER,
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APPARATUS FOR MANUFACTURING FLOUR.

SPECIFICATION forming part of Letters Patent No. 647,664, dated April 17, 1900.

Application filed March 22, 1897. Serial No. 628,569. (No model.)

To all whom it may concern:

Be it known that we, SIDNEY LEETHAM, residing at Hungate, in the county of York, and HENRY SIMON, residing at Manchester, in the county of Lancaster, England, subjects of the Queen of Great Britain, have invented a new and useful Improvement in Methods of and Apparatus for Manufacturing Flour, of which the following is a specification.

In machines in which flour is sifted, bolted, or separated under ordinary conditions moisture condenses more or less upon the reticulated or perforated surfaces through which the flour is passed and some of the finer particles of flour become pasted upon these surfaces. Thus in flour dressing or sifting machines in which bolting-silk is employed fine flour particles become pasted upon the threads of the silk, whereby the meshes become gradually obstructed and the sifting action is gradually impaired. In many cases the sieve or reel clothing becomes useless from this cause and must be renewed long before it is worn out. The moisture which creates this difficulty arises largely from atmospheric conditions, which are different at different times and which in many localities differ widely in different seasons. When the air contains a large percentage of humidity, the sifting-surfaces bolt much less freely than when the air is comparatively dry. In many localities it is not practicable, owing to the prevailing humidity of the air, to bolt the flour through cloth of very fine mesh, and bolting-cloth of a coarser mesh is necessarily employed. This prevents the production of the highest grades of finely-dressed flour.

The object of this invention is to overcome this difficulty by providing for the flour dressing, sifting, or separating machines an artificial atmosphere which is so warm and dry that the condensation of moisture in the machine is prevented, without, however, in any way interfering with the normal operation of the machine and the supply of the material to the same and the discharge of the products of the separation therefrom. This object is attained, briefly stated, by supplying to the chest or casing containing the bolting, sifting, or separating apparatus a current of

heated air, which fills said chest and envelops the bolting or sifting apparatus therein, and by causing a constant outflow of air from said chest through an outlet provided in the upper portion of the chest for that purpose, through which outlet the air which has absorbed moisture escapes constantly and without in any way interfering with the normal operation of the machine.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a flour-bolt provided with our improvements. Fig. 2 is a cross-section of the supply-tube for the heated air in line 2 2, Fig. 1, on an enlarged scale. Fig. 3 is a similar view showing a modified construction of the tube.

Like letters of reference refer to like parts in the several figures.

A represents the reel or cylinder of a flour-bolt of any suitable or well-known construction; B, the inclosing chest or casing; c, the feed-spout, and d the conveyer for the bolted flour.

E represents a blast-fan, and F a steam heating apparatus which receives the air from the fan E and in which the air is heated to a suitable temperature, which may range from 90° to 180° Fahrenheit. A valve f, of any suitable construction, is arranged in the air-passage leading to the heater or elsewhere in the air-passage to regulate the flow of the air. The heated air passes into a distributing pipe or passage G, which is arranged in the lower portion of the casing B and by which the heated air is delivered into the casing. This pipe or passage may be of triangular cross-section and provided with numerous openings g in its sloping sides, as shown in Figs. 1 and 2, or it may be provided with outlet-openings in its bottom, as represented in Fig. 3, or it may be of any other suitable construction, so as to distribute or diffuse the heated air evenly through the interior of the machine.

H represents a suction-fan which removes the moist air from the upper portion of the casing through a spout h, provided with suitable valves i, and delivers the air to a dust-collector J, of any suitable construction, by which the solid particles carried off by the

air-current are separated from the air and collected.

The volume of heated air which is supplied to the casing of a flour dresser or bolt is comparatively small, as a limited volume of moderately-heated air is sufficient to keep the interior of the machine at a uniform temperature somewhat higher than the surrounding atmosphere and at the proper degree of dryness. Under these conditions no condensation of moisture can take place by reason of the somewhat-higher temperature which is maintained in the bolting-machine and the constant removal of the moist air therefrom, and the operation of bolting the flour is carried on uniformly, irrespective of the variable conditions of the surrounding atmosphere.

Our improvement permits the use of bolting-silk of a much finer mesh than usual without danger of clogging and produces the highest grades of finely-dressed flour, irrespective of climatic conditions and the greater or less percentage of moisture contained in the material which is being bolted. The flour produced in this manner is also much more free from impurities, and consequently whiter and more valuable than that produced by the usual methods.

By employing both an exhaust-fan and a blast-fan in connection with the chest or casing in which the bolting, sifting, or separating apparatus is arranged the formation of a plenum, as well as of a vacuum in the chest or casing, is avoided. The air in the chest is not under pressure, as it would be when a blast-fan alone is employed, in which case the air tends to blow out in every direction, and the air-pressure is not reduced by the formation of a partial vacuum, as it would be if an exhaust-fan alone were employed, in which case the external air would be drawn into the chest from every direction. The air escapes from the chest through the outlets in

the top of the latter and does not in any way interfere with the supply of material to be separated in the machine, or the discharge of these separated materials therefrom, all of which operations take place in the usual and normal manner. The exhaust-fan drawing from the top of the chest insures the effective removal of the air which has absorbed moisture. This can be nicely regulated by the slides or valves controlling the air-outlets in the top of the chest.

We claim as our invention—

1. In a machine for operating upon flour, the combination with a bolting apparatus and its inclosing casing, of a fan, a heater for heating the current of air set in motion by the fan, an air-duct leading the heated air-current to the casing and opening in the same below the bolting apparatus, an air-outlet arranged in the casing above the bolting apparatus, and means for regulating the flow of heated air through the casing, substantially as set forth.

2. In a machine for operating upon flour, the combination with a bolting apparatus and its inclosing casing, of a blast-fan, a blast-spout leading from said fan to said casing and opening in the lower part of the same, a heater whereby the air-current is heated before entering the casing, and an exhaust-fan having its suction-spout connected with the upper portion of said casing, substantially as set forth.

Witness our hands this 27th day of February, 1897.

SIDNEY LEETHAM.
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