R. BUCHANAN.

FLOUR MILLING.

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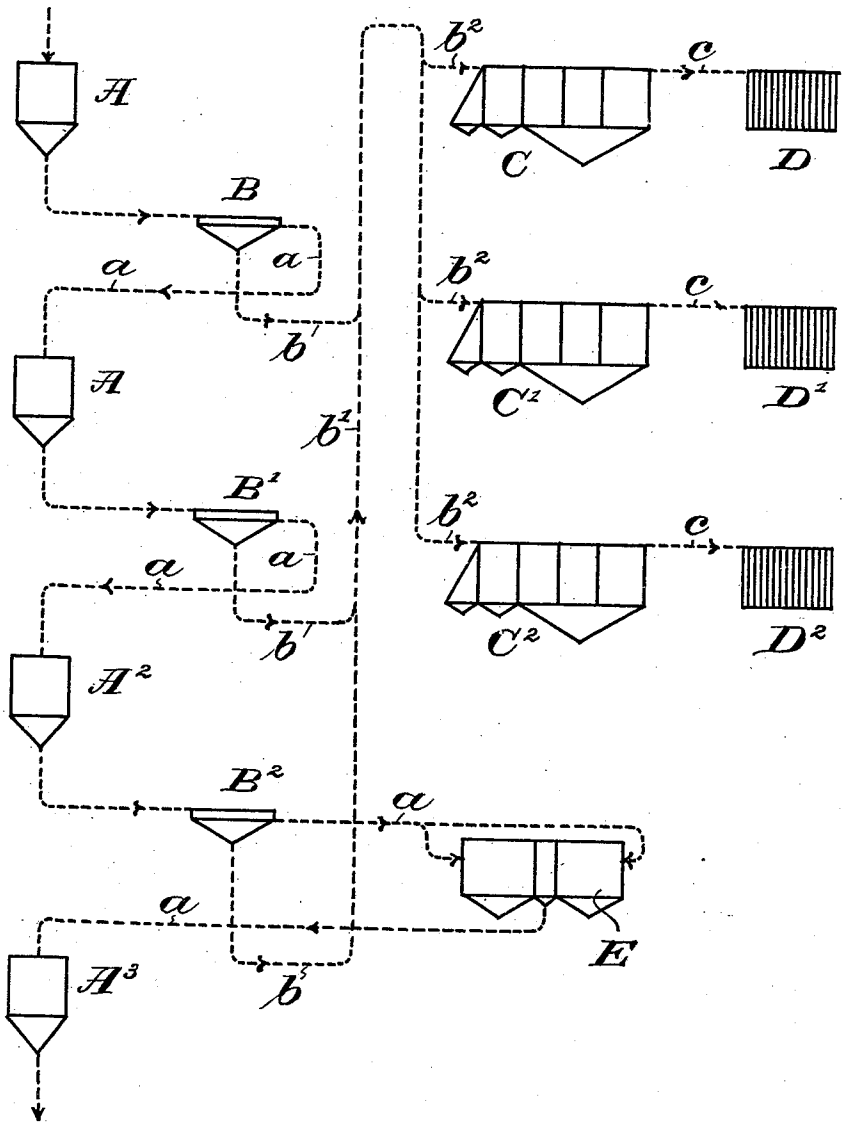
977,431.

Patented Dec. 6, 1910.



Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT BUCHANAN, OF LIVERPOOL, ENGLAND.

FLOUR-MILLING.

977,431. Specification of Letters Patent. Patented Dec. 6, 1910.

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To all whom it may concern:

Be it known that I, ROBERT BUCHANAN, a subject of the King of Great Britain and Ireland, and a resident of Liverpool, in the county of Lancaster, England, have invented new and useful Improvements in and Relating to Flour-Milling, of which the following is a specification.

This invention relates to improvements in and connected with that method of and appliances for flour milling in and by which the break roll products, after having had the whole or the bulk of the material which requires further breaking skimmed off or separated by a scalping sieve, are graded for the reduction rolls in purifiers or by or with the assistance of air currents. Its main object is to permit a reduction in the number of appliances employed and power required in and about the process.

According to my present improvements I bring together the "throughs" (or those particles which have passed through the meshes of the sieves) as they issue from the scalping sieves of the 1st., 2nd., 3rd., or more particular breaks or any number or combination of such scalping sieves and transport the thus brought together and mixed "throughs" by a single elevator to a purifier or to be distributed to the requisite series or numbers of purifiers for grading. An economy in elevating appliances and power is thus effected over the present usual arrangement in which the "throughs" of the scalping sieve or sieves of each particular break are separately conveyed to their purifier. The scalping sieves used may separate or skim off only the bulk of those larger particles of the break roll products which require further treatment between break rolls, or such sieves may skim off and separate the whole of such larger particles which require further breaking, and only pass through them the smaller particles which are to be graded in the purifiers.

The accompanying drawings diagrammatically illustrate how my improvements may be carried out in connection with a system of milling having four sets of break rolls.

A, A^1, A^2, A^3, indicate the four sets of break roller machines. The chops or broken products from the first three A, A^1, A^2 are led respectively to scalping sieves B, B^1, B^2 which are so meshed or clothed as to prevent the passage through the meshes of all or most of the larger particles which require further breaking treatment in any subsequent break rolls. These larger particles or overtails are led to successive break rolls A^1, A^2, A^3, either directly or through any required intervening machinery, their course being indicated by the flow lines *a*. The finer materials which have passed through the meshes of the separate sieves B, B^1, B^2, (and which finer particles are known as semolinas, middlings, dunst, heavy flour, beeswing, and light branny particles, light flour and dust) are straightway led to and mixed together in a common or single elevator or conveyer for conveyance to the purifier or purifiers C, C^1, C^2 in which the specified grading takes place.

b indicates the separate flow lines of the finer particles or "throughs" from each of the scalping sieves to the common or single elevator. b^1 the flow line of the mixed "throughs" from the various sieves through the common or single elevator, and b^2 the branch flow lines from such common or single elevator into different purifiers. The "throughs" or finer particles thus collectively conveyed to the purifiers may then be directly purified or treated with air currents to effect the further separation or grading in the known manner, but if desired and as is already known, the "throughs" before grading may have the fine flour first separated from them by passing them over and down an inclined sieve through which an inward air current passes to suck the flour and fine dust through such sieve, but which sieve will not permit the passage through its meshes of the semolinas, middlings and the like.

Any suitable form of purifiers or appliances for or system of purification or grading by or with air currents may be employed to grade the collected mixed and transported "throughs" from the scalping sieves. Instead of all the "throughs" from all the scalping sieves being brought to and mixed in a common or single elevator in the manner described, the "throughs" from any two or more such sieves may similarly be brought to and mixed in a common or single elevator and be collectively conveyed to the purifier or purifiers. The scalping sieves may be differently disposed in relation to the break rolls than as illustrated. Any con-

venient number or series of purifiers may be employed to deal with the mixed "throughs" of two or more scalping sieves.

The light flour and dust from the purifier or purifiers is carried away with the air used for the grading and may be fed to a "Cyclone" or other centrifugal separator for collection as is usual, but it is preferred to carry such flour and dust to textile or cloth dust collectors D, D^1, D^2, constructed and operating in any known manner, and thus avoid any loss caused by evaporation which may take place when such flour is led to a centrifugal separator with the air constantly discharging to the atmosphere. The textile collectors also effect the collection of a quite appreciable quantity of fine flour which a "Cyclone" separator is quite unable to retain. *c c* indicate the flow lines of the fine flour and dust from the purifiers to the textile dust collectors.

Other apparatus and machines which are commonly used in the process of milling in connection with those described are not herein referred to or illustrated as their uses and dispositions are perfectly well known, and I use them where necessary in the well known manner. For example the appliance indicated at E is a double centrifugal for removing flour, semolinas or the like from the branny matters before they reach the fourth break rolls.

By the reference to scalping sieves I include any apparatus which will effect the desired separation of material which requires further treatment by break rolls and by the term "throughs" I mean not only material which has passed through a sieve, but I include material of a like nature which has been separated from the material which requires further breaking, quite irrespective of the form or type of appliance by which such separation has been effected.

I claim:—

1. In a system of flour milling, the combination of a plurality of scalping sieve systems, a single chute or conveyer in communication with such plurality of scalping sieve systems to receive their "throughs," and apparatus to which the said single chute or conveyer delivers the said "throughs" for grading by or with the aid of air currents, as herein set forth.

2. In a system of flour milling, the combination of a plurality of sets of break rolls, separate scalping sieve systems for each such set, chutes or conveyers for leading the overtails of such scalping sieve systems to their next following sets of break rolls, a single chute or conveyer in communication with a plurality of the said separate scalping sieve systems to receive the "throughs" of such plurality of separate scalping sieve systems, and purifiers to which the said single chute or conveyer delivers the said mixed "throughs" for grading by or with the aid of air currents, as hereinbefore set forth.

3. In a system of flour milling, the combination of a plurality of sets of break rolls, separate scalping sieve systems for each such set, chutes or conveyers for leading the overtails of such scalping sieve systems to their next following sets of break rolls, a single chute or conveyer in communication with a plurality of the said separate scalping sieve systems to receive the "throughs" of such plurality of separate scalping sieve systems, purifiers to which the said single chute or conveyer delivers the said mixed "throughs" for grading by or with the aid of air currents, and dust collectors to which the air and dust from said purifiers is delivered, as hereinbefore set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT BUCHANAN.

Witnesses:

ARTHUR CATCHPOOL,

ERNEST BUCHANAN.