Sept. 16, 1930. H. G. HOWELL ET AL 1,776,186

WOOL CLEANING AND SCOURING APPARATUS

Filed Dec. 27, 1929 2 Sheets-Sheet 1

Fig. 1

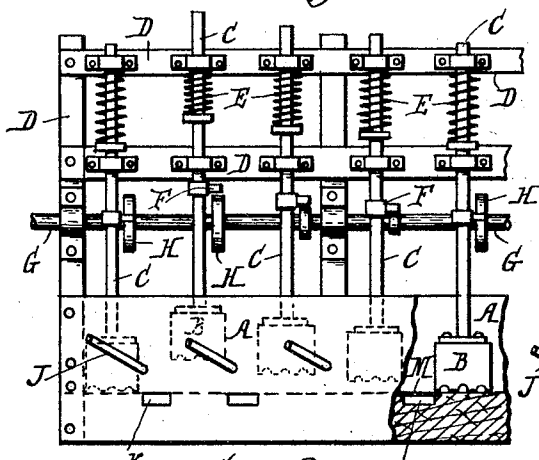


Fig. 2

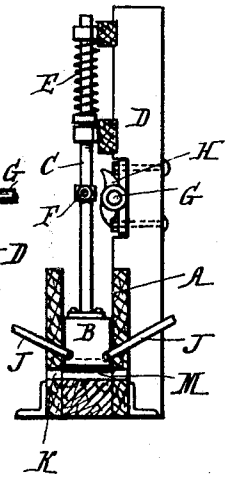


Fig. 3

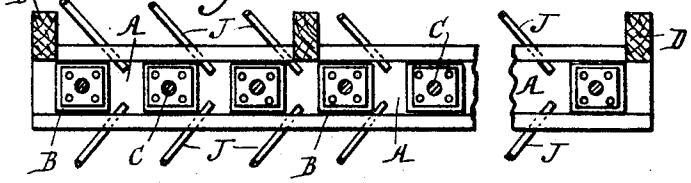


Fig. 4

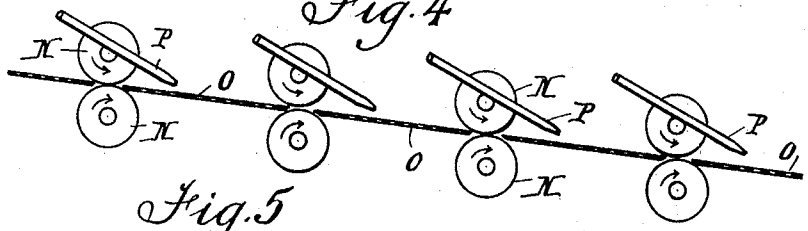
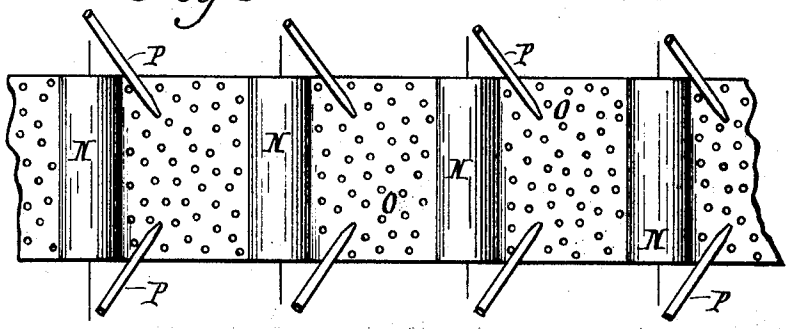


Fig. 5



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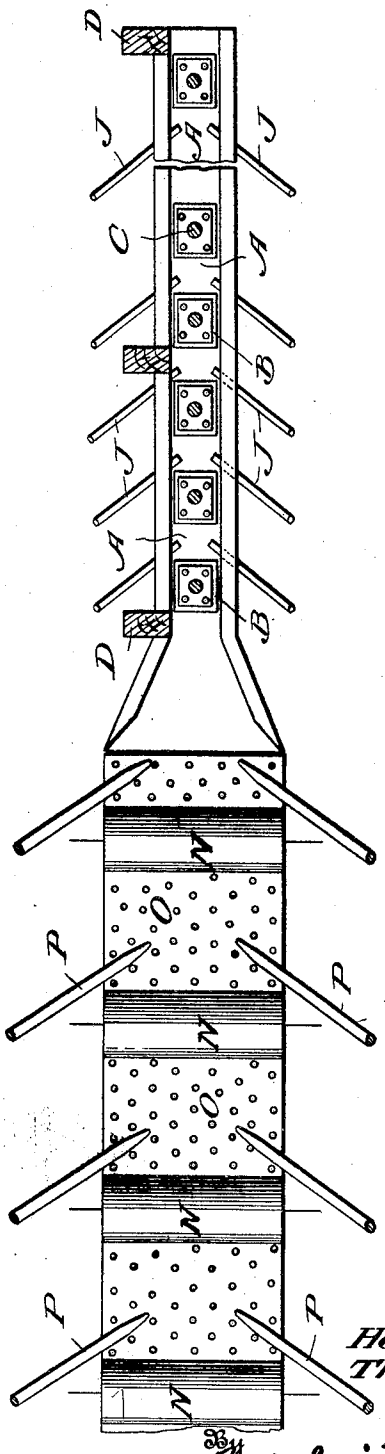


Fig. 6.

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UNITED STATES PATENT OFFICE

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WOOL CLEANING AND SCOURING APPARATUS

Application filed December 27, 1929, Serial No. 416,834, and in New Zealand August 20, 1928.

This invention has been devised with the object of providing means for the cleaning and scouring of wool of such a nature that by their use a new method of treatment is effected in which the natural greases of the wool are retained while dirt and strains and foreign colouring matters are removed. The method concerned also provides for a cheap and quick operation as compared with the methods now generally in use.

The invention is of particular adaptation to the treatment of "dags" or dag wool, (i. e. those portions of the fleece shorn from the hind quarters and tangled and stained with the sheep's ordure) in order to recover the wool therefrom and at the same time to remove dirt and stain from the wool.

The invention comprises as its essential feature the use of apparatus constructed to subject the wool while it is being fed by means of water jets along a surface, to a series of repeated beating or pounding actions obtained by the use of beaters or stampers acting thereon.

This operation may follow an initial treatment in which the wool is first steeped in clear water for a period, to soften the foreign matters mingled therewith, and is subsequently passed through between a series of crushing rollers, while being subjected to the force of jets of water directed thereon, for the purpose of crushing up all such foreign matters, to render them more readily separable in the beating or pounding operations.

The invention may be given effect to by the employment of apparatus of any approved design having the said actions upon the wool and it is not intended that it shall be confined to any particular design of apparatus.

In the accompanying drawings there is shown, in diagrammatic form, apparatus suitable for giving effect to the invention.

In such drawings:—

Figure 1 is a side elevation of the beating or pounding machine.

Figure 2 is an end elevation, and

Figure 3 a horizontal sectional view thereof.

Figures 4 and 5 are respectively side elevation and plan of an arrangement of crushing rollers and water jets suitable for the initial crushing treatment when such is required.

Figure 6 is a horizontal sectional view showing the arrangement of Figs. 4 and 5 associated with the beating or pounding machine.

In the apparatus shown in Figures 1 to 3, a long narrow trough A of approved depth, width and length, is provided, and arranged horizontally. This trough is made with a firm bottom, and with side walls arranged vertically parallel, the whole being suitably braced and strengthened to form a firm structure. A number of stamper blocks B are fitted into the trough to move up and down between its sides, these blocks being made of suitable material, and being spaced at regular distances apart along the trough length. The said blocks B are connected to means whereby they will be raised a distance and dropped on to the trough bottom, in regular order, in series from the inlet to the outlet end of the trough.

The means for effecting the movements of the blocks, as shown, comprise the attachment of each block to the lower end of a vertical rod C that is carried in guides upon a framing D so that it may slide freely up and down, but is kept normally down by means of a compression spring E surrounding its upper end. A tappet F is fixed upon each rod C and a cam shaft G is mounted to extend horizontally in the framing alongside the several rods. On this shaft a cam H is fixed for each tappet, such cam being constructed to engage the tappet and lift it and then to free it so that it may drop, in a manner well known in ordinary stamper construction. The rod and block as they fall in each case, have the strength of the spring E imparted to them, so that the block engages the bottom of the trough A with an impact determined by such strength and the weight of the block.

Combined in the trough are a number of water nozzles J disposed to enter through the trough sides immediately above the level of the trough bottom at an angle inclining

inwards and in the direction of the delivery end of the trough. These enter from both sides and are preferably disposed in pairs (one pair between each two stamper blocks) so that they concentrate the jets issuing therefrom along the centre line of the trough and to pass beneath the stamper block in front when it lifts.

These nozzles are connected with a water supply service designed to provide for the jets issuing therefrom at high pressure, and for this purpose may be combined with any high pressure source.

In the operation of this apparatus, the wool is fed into the feed end of the trough A by any suitable method providing for it passing evenly and continuously, and is acted upon by the water jets to be carried along the trough bottom while being continuously sluiced by the water, the stampers at the same time rising to permit the wool to pass and dropping to stamp or pound it between them and the trough bottom. This combined stamping or pounding action, and washing or sluicing action, will therefore act upon the wool to scour it and free it from foreign dirt and colouring matters and stains. If desired, the water supplied to the nozzles, or to some of them, may contain chemical bleaching agents of known and approved nature, or cleansing and scouring agents, to act upon the wool.

The apparatus thus described is adapted for dealing with all classes of wool, the period of treatment being governed by the force and size of the water jets, and the rate at which the stampers are actuated and also by the length of the trough and the number of stampers. Water and dirt are allowed to escape from the trough at points between the stampers, by providing side draining channels K in the trough bottom which channels are covered by suitably perforated plates M.

When the apparatus is required to deal with "dags" or dag wool and like classes of wool, such wool should be treated initially by soaking in vats containing clean water, and then passing it through a series of crushing rollers while subjected to jets of high pressure water directed thereon and carrying the wool across perforated draining tables between the crushing rollers.

A suitable arrangement of rollers and tables is shown in Figures 4 and 5. This comprises a series of pairs of superimposed crushing rollers N disposed at intervals apart along a table O that inclines downwards from one end to the other. The said table extends between the rollers of the several pairs at the level of their points of contact, and for the major portions of its length between each two pairs, is made of a perforated nature. Any desired number of pairs of rollers may be thus provided.

The individual pairs of rollers may be geared to be driven in opposite directions.

Combined with the rollers and table are water nozzles P disposed to deliver jets of water at an incline downward and inwards upon the table at approved points along it, such as below each pair of rollers. These nozzles are connected up with a high pressure supply source so that the streams of water directed on to the apparatus are such as to effectually feed the wool, delivered on to the upper end of the table, down through the several sets of rollers in turn, and at the same time to sluice the wool to free it from foreign matters, as dirt, which is strained off through the perforated table.

The table O will be arranged to deliver the wool passing from its lower end, directly into the trough A of the stamping or pounding apparatus so that the operation is carried on in sequence and without any handling of the material between the two treatments.

We claim:—

1. Wool cleaning and scouring means, comprising in combination an inclined perforated table along which the wool is fed, a series of crushing rollers adjacent the table and adapted to operate upon the wool as it is fed along the table, a surface to receive the wool from the inclined table, a series of stampers disposed above said surface and operable to stamp the wool passing thereunder, and nozzles directed upon said inclined table and surface to deliver jets or streams of water thereupon.

2. Wool cleaning and scouring means comprising in combination a stationary surface along which the wool is fed, a series of stampers mounted above said surface, means for causing said stampers to rise and to drop upon said surface, and means comprising a number of nozzles projecting toward one edge of said surface to direct jets of washing water upon said surface, to feed the wool along the surface beneath the stampers.

3. Wool cleaning and scouring means comprising the combination of a stationary surface along which the wool is adapted to be fed, a series of stampers mounted above said surface, means normally urging said stampers towards said surface, means for raising said stampers and releasing them to rapidly return to the surface under the influence of said urging means, and means comprising nozzles projecting towards one edge of said surface to direct jets of water upon said surface to cause the wool thereon to be fed along the surface beneath the stampers.

In testimony whereof, we affix our signatures.

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THOMAS REGINALD HOWELL.