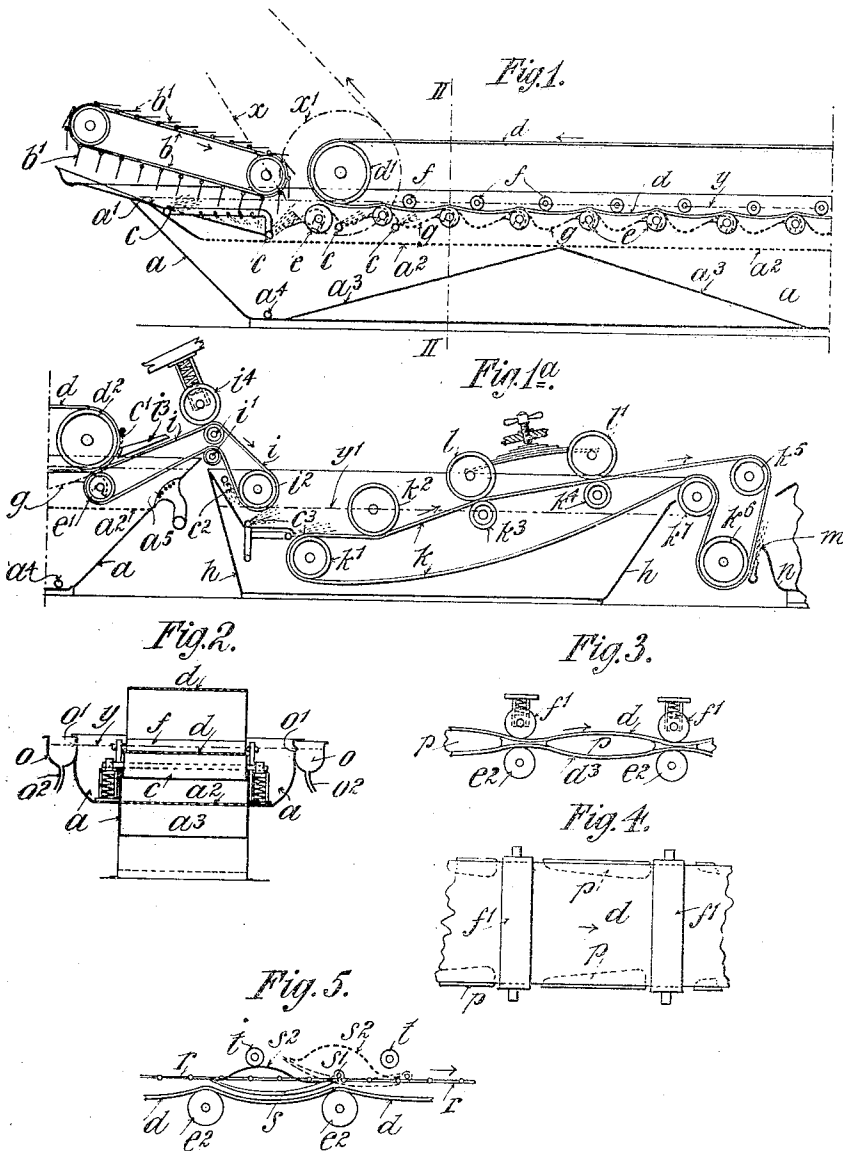


June 20, 1933.

E. V. HAYES-GRATZE
MACHINE FOR USE IN SCOURING EITHER WOOL AND
OTHER ANIMAL FIBERS OR VEGETABLE FIBERS
Filed Dec. 21, 1931

1,914,599



INVENTOR.

E. V. Hayes-Gratze.

Per

A. Milward Hack.
His Attorney.

UNITED STATES PATENT OFFICE

EUGENE VICTOR HAYES-GRATZE, OF LONDON, ENGLAND

MACHINE FOR USE IN SCOURING EITHER WOOL AND OTHER ANIMAL FIBERS OR
VEGETABLE FIBERS

Application filed December 21, 1931, Serial No. 582,391, and in Great Britain January 9, 1931.

This invention relates to a new or improved machine for use in scouring either wool and other animal fibers or vegetable fibers, and for washing or cleaning yarns, textile fabrics or the like, and has for its primary objects reducing the time and number of vats at present required to effectually scour the fiber or cleanse fabrics or the like, thereby saving floor space, power and labour and at the same time produce, in the case of fibers, a better product, i. e. without stretching, stringing or matting, than is possible with existing scouring machines.

The present invention comprises a vat or suitable container having means for feeding the fibers into one end thereof and deliver them in a scoured condition at the other end, means for subjecting the fibers preferably on entry to pressure jets or sprays of scouring solution or fluid, said jets or sprays being so arranged as to facilitate the breaking up or separation of the mass of fibers, and means for subjecting the fibers to an intermittent pressing or squeezing action during their travel through the scouring solution in the container, said means preferably consisting in passing the fibers between pressure rollers and a travelling belt or between the surfaces of a pair of travelling belts pressed together or an equivalent arrangement.

This invention will be now more particularly described making reference to the accompanying drawing in which:—

Figs. 1 and 1^a is a diagrammatic view in sectional side elevation of a machine embodying the present invention.

Fig. 2 is a view in section on line II—II of Fig. 1.

Figs. 3 and 4 are broken views in side elevation and plan respectively of a modification, and

Fig. 5 is a broken view in side elevation of a further modification.

Throughout the views similar parts are marked with like letters of reference.

A vat or container *a* is provided at its one end with any suitable device for feeding the wool or fibers into the machine. This feeding device may comprise an endless belt *b* provided with a plurality of hinged tines *b*¹ adapted to engage and evenly feed the wool or fibers down an inclined plane or chute *a*¹ situate at the forward end of the vat *a*. A tube *c* provided with jets or nozzles is carried within the vat *a* near the chute *a*¹. This tube is in communication with a supply of scouring liquid which is delivered to the jets or nozzles under considerable pressure. The jets or nozzles are so arranged as to cause the liquid issuing therefrom to impinge on and cause motion in the mass of fibers moving down the chute *a*¹ thus tending to break up or separate the fibers one from the other and rid them—in the case of wool—from the bulk of suint, sand and other impurities. The jets of solution or fluid tend to separate out the scouring solution and cause precipitation of the sand and other impurities, at the same time allowing the lighter matter, such as suint, to float to the top of the liquid. The vat *a* is provided with a perforated false bottom *a*², and the sides and bottom *a*³ are preferably sloped as shown to form sumps into which the heavy impurities tend to settle and which may be emptied by means of valved outlets *a*⁴.

Above and partly within the vat *a* and for the greater part of its length is mounted an endless belt *d* passing over drums *d*¹ *d*², one or both of which may be driven from any convenient source of power. The axle of the drum *d*¹ is preferably driven by a belt *x* passing round a pulley *x*¹ on said axle. The lower part of the belt *d* is arranged below the normal level *y* of the scouring solution in the vat *a*. The scouring solution may be caused to circulate or flow through the vat and may be drawn off through a strainer outlet *a*⁵. The lower part of the belt *d* is given an undulatory movement during its travel by passing over and under a plurality of transversely arranged spring pressed rollers or drums *e* and rollers *f*. The said rollers exert a squeezing action on the fibers passing between the under surface of the lower part of the belt *d* and the peripheries of the rollers *e*. The bearings for the axles of the rollers *e* are preferably pressed upwardly by means of compression springs, as shown more particularly in Fig. 2. The belt *d* is preferably perforated as shown more particularly in Fig. 2.

Between the rollers *e* are carried shaped trays *g* which are preferably perforated. The rear end of each tray *g* is at its sides slotted to fit over the axles of the rollers *e* so as to be free to rock thereon and the forward edge of the tray rests on the periphery of the roller immediately in front of it to act as a scraper.

The fibers on entering the solution are first acted upon by the jets issuing from the pipe *c* which also cause the fibers—also helped by the flow of the liquid through the vat—to move over the first roller *e* into contact with the under side of the belt *d*. The fibers are then carried along through the vat between the belt and the rollers being alternately squeezed and compressed and allowed to expand and absorb fresh liquor in each of the trays *g*.

After the fibers have passed to the outgoing end of the machine, they are automatically carried to the rinsing or swilling vat *h* by any suitable form of conveyor. A convenient construction is that shown wherein an endless belt *i* passes over the last spring pressed roller *e*¹, pulleys *i*¹ above the surface of the liquids in both the vats *a* and *h* and drum *i*², the periphery of which is or may be below the surface *y*¹ of the water or rinsing solution in the vat *h*. The belt *i* is in contact with the belt *d* as it passes over the drum *d*² and the fibers are prevented from riding round with the main belt *d* by means of jets *c*¹ of liquid or air under pressure or by suitably placed scrapers. The fibers are then carried by the belt *i*, being guided thereon by guides *i*³, beneath a spring pressed drum *i*⁴ which serves to express the major quantity of scouring solution from the fibers which are then deposited into the swilling liquid in the vat *h*. Any fibers adhering to the belt *i* as it passes upward over the drum *i*² are removed by jets *c*² of fluid under pressure. Other jets *c*³ of fluid under pressure tend to carry the fibers on to an endless belt *k*, which is carried by pulley *k*¹, *k*², *k*³, *k*⁴, *k*⁵, *k*⁶ and *k*⁷, so that the fibers are conveyed through the solution in the vat *h*. Above the pulley *k*³ *k*⁴ are arranged spring pressed rollers *l* *l*¹ in order to squeeze the washing solution from the fibers in their upward passage out of the vat.

The partially dried fibers are then blown from off the surface of the belt *k* by air jets *m* into a container *n*.

The sides of the vat *a* (see Fig. 2) may be provided with gutters or troughs *o* for the purpose of draining off the suint or wool fat that floats on top of the scouring solution. For this purpose, the gutters *o* are provided with perforations *o*¹ near the level *y* of the liquid in the vat *a*. The suint is removed from the gutters *o* by outlet pipes *o*².

In the modification shown in Figs. 3 and 4, a pair of belts *d*, *d*³, are used in place of a single belt *d* the fibers passing between said

belts *d*, *d*³, either one or both of which may be perforated. In such case, the upper rollers *f*¹ are preferably spring pressed downwardly on to supporting rollers *e*². The belts between the pairs of rollers *f*¹ and *e*² may be opened out by means of stream lined shaped guide plates *p* arranged at the sides of and between the belts, their function being to guide and close the fibers together before the latter pass to the next pair of rollers.

In the further modification shown in Fig. 5, a chain or linked belt *r* is arranged above and driven at the same speed as the main belt *d* which is supported by rollers *e*². The belt *r* carries a plurality of presser plates *s* hinged at *s*¹ to said belt, which plates are provided with cam or spring shaped upper parts *s*² adapted to contact with stationary rollers *t* as the belts are traversed.

It will be appreciated that the fibers, carried on the surface of the belt *d*, which is preferably perforated, are alternately compressed by the plates *s* against the surface of the belt *d*.

I declare that what I claim and desire to secure by Letters Patent is:—

1. A machine for use in scouring fibers and the like comprising a container adapted to contain scouring liquid therein, means for feeding the fibers into one end of said container below the surface of the liquid therein and delivering the fibers in a scoured condition at the other end, submerged jets of scouring solution under pressure arranged near the feeding end of the container to separate the fibers, and means for subjecting the fibers to an intermittent squeezing action whilst submerged beneath the surface of the scouring liquid, as set forth.

2. A machine for use in scouring fibers and the like comprising a container adapted to contain scouring liquid therein, means for feeding the fibers into one end of said container below the surface of the liquid therein, submerged jets of scouring solution under pressure arranged near the feeding end of the container to separate the fibers, means for subjecting the fibers to a series of intermittent squeezing actions whilst submerged beneath the surface of the scouring liquid, a rinsing vat at the delivery end of the container, means for delivering and squeezing the fibers and freeing them from excess scouring solution, jets of rinsing liquid under pressure arranged near the entry end of the rinsing vat, means for conveying the fibers through the rinsing liquid in the vat and squeezing them after removal from the liquid and means for automatically delivering the squeezed fibers to a container, as set forth.

3. A machine for use in scouring fibers and the like comprising a container adapted to contain scouring liquid therein, means for feeding the fibers into one end of said container below the surface of the liquid therein

and delivering the fibers in a scoured condition at the other end thereof, submerged jets of scouring solution under pressure arranged near the feeding end of the container to separate the fibers and means for subjecting the fibers to a series of intermittent squeezing actions whilst submerged beneath the surface of the scouring solution consisting of a longitudinally arranged endless travelling belt the lower part of which is submerged beneath the scouring liquid, a plurality of rollers between which and the under surface of the lower part of the belt the fibers are forced to pass, and means for resiliently mounting said rollers so as to cause an intermittent squeezing action on the submerged fibers during their passage through the bath, as set forth.

4. A machine for use in scouring fibers and the like comprising a container adapted to contain scouring liquid therein, means for feeding the fibers into one end of said container below the surface of the liquid therein and delivering the fibers in a scoured condition at the other end thereof, submerged jets of scouring solution under pressure arranged near the feeding end of the container to separate the fibers and means for subjecting the submerged fibers to pressure during their travel through the bath consisting of a pair of longitudinally arranged travelling belts yieldably pressed together at intervals and between which the fibers are carried beneath the surface of the scouring liquid, as set forth.

5. In a machine for use in scouring fibers and the like comprising a container adapted to contain scouring liquid therein, means for subjecting the fibers to pressure during their travel through the bath consisting of a plurality of presser plates pivoted to a longitudinally arranged belt travelling beneath the solution in the bath, and means for exerting intermittent pressure on the fibers passing between said plates during their passage through the bath, as set forth.

EUGENE VICTOR HAYES-GRATZE.

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