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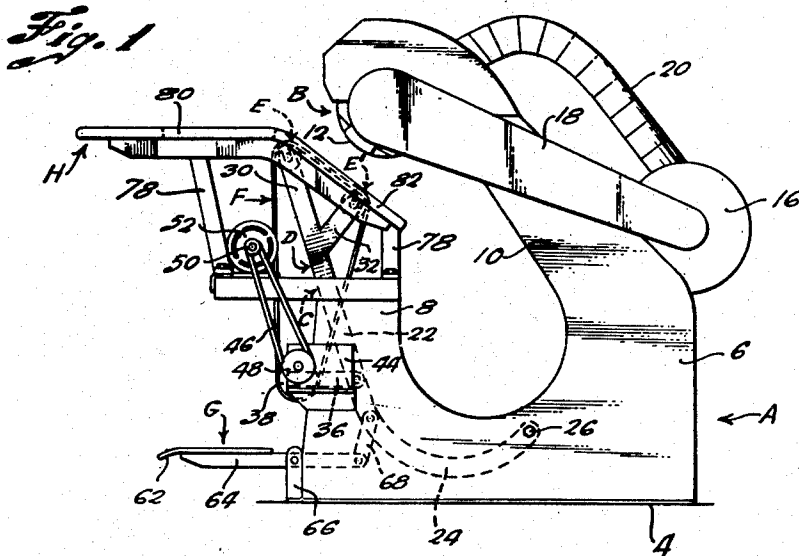
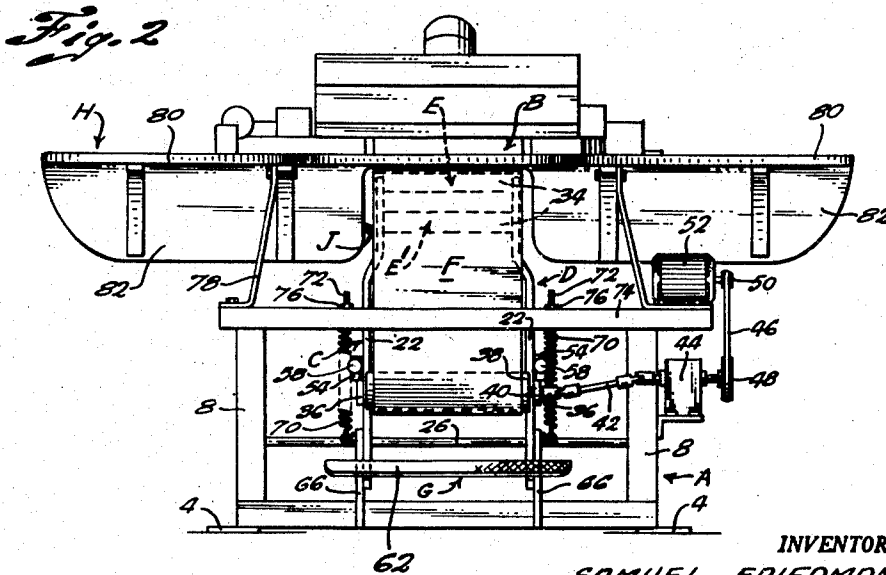
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2,477,448

FUR CONDITIONING MACHINE

Filed Oct. 1, 1948

2 Sheets-Sheet 1



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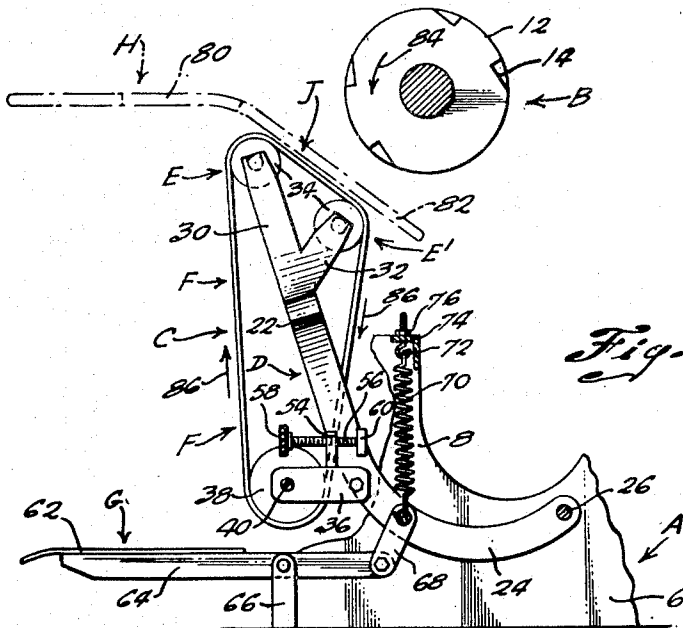
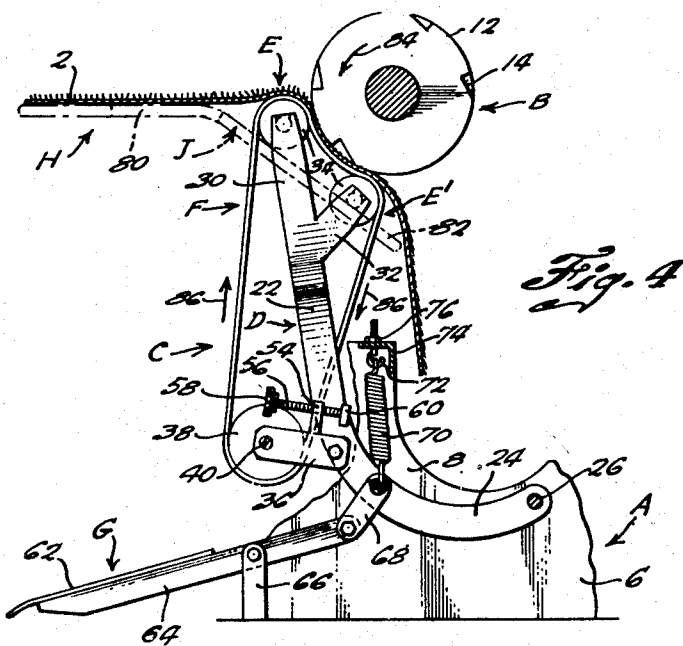
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UNITED STATES PATENT OFFICE

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FUR CONDITIONING MACHINE

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Application October 1, 1948, Serial No. 52,300

12 Claims. (Cl. 69—24)

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The present invention relates to a fur conditioning machine, and in particular to a fur ironing machine particularly adapted for the reconditioning of finished fur garments.

Fur conditioning machines are well known of the type in which a fur is caused to pass over a rapidly rotating heated drum which may optionally be provided with brushing elements. Such machines are quite efficient in ironing and brushing fur pelts and unfinished or unlined fur garments. They have, however, not performed very efficiently in the conditioning of large fur pieces because the fur conditioning drum contacted the fur piece only over a relatively small area. Certain modifications in the basic prior art design have been carried out to cure this disadvantage, these modifications generally taking the form of the employment of a pair of feeding rollers spaced with regard to the fur conditioning drum, one of those rollers moving more rapidly than the other so as to tension the fur piece and thus cause it to contact the fur conditioning drum over a substantial area. Such a machine is illustrated in my Patent No. 1,874,273 of August 30, 1932. However, that modification has the marked disadvantage that a considerable strain is exerted on the non-furry surface of the fur piece. This is not objectionable when fur pelts are being treated, but when it is desired to recondition an already lined garment machines of the type shown in my Patent No. 1,874,273 are quite ineffective, since the tensioning effect exerted by the two rollers rotated at differing speeds does not tension the fur but instead acts to rip and tear the fragile lining which makes contact with those rollers. Another disadvantage of the above type of improved fur conditioning machine is that the force which presses the fur piece against the conditioning drum is limited and is to a large extent uncontrollable. The importance of this drawback is apparent when it is realized that the brushing and ironing effect exerted by the conditioning drum is to a large extent dependent upon the force with which the fur piece is pressed thereagainst. Moreover, different furs will require different pressures and two furs of the same type but of different condition insofar as wear is concerned will require different optimum pressures. Consequently, the lack of accurate pressure control inherent in the prior art machines presented a considerable problem.

From a practical point of view, the size of the fur conditioning drums are limited both by economic and mechanical factors and as a result the drums are in almost all cases of a size such that, while they are generally larger than some indivi-

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dual fur pelts, they are considerably smaller than a complete fur garment, such as a coat. This has made for some difficulty when finished garments are to be reconditioned. A full size fur coat is exceedingly awkward to work with and is often quite heavy and bulky. Only a small part thereof can be worked on at any one time by the fur conditioning drum and in the past the remainder of the garment has either been permitted to dangle from the machine or has caused great inconvenience to the operator, who must hold it away from the floor of the plant and the greasy and dirty moving parts of the fur conditioning machine. As a result, the conditioning of complete fur garments has not only been hazardous to the garments but has been extremely time consuming and very trying to the operator of the machine.

It is the prime object of the present invention to devise a fur conditioning machine so constructed as to be particularly adapted for use with finished fur garments, including those garments which are considerably larger than the size of the fur conditioning drum.

A further prime object of the present invention is to devise a fur conditioning machine the efficiency of which is materially increased by causing the fur body to contact the fur conditioning drum over a substantial area thereof while at the same time minimizing undesired strains on the fur.

Yet another object of the present invention is to devise such a machine in which the pressure of the fur piece against the conditioning drum may be closely controlled, thus permitting the same machine to be used for varying types of furs or for furs of the same type in varying conditions of wear with the greatest efficiency.

Yet another object of the present invention is to devise a fur conditioning machine the conditioning parts of which are of conventional size, a work supporting table of size sufficient to support a finished fur piece such as a coat being employed in conjunction therewith.

Yet another object of the present invention is to devise such a machine employing an endless belt for conveying the fur piece past and over the fur conditioning drum, said belt and its guides being so arranged that the fur piece on the belt is caused to be pressed against the fur conditioning drum and to conform thereto over a substantial area thereof.

To the accomplishment of the foregoing objects and such other objects as may hereinafter appear, the present invention relates to the construction of a fur conditioning machine as defined in the appended claims and as set forth in

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this specification, taken together with the accompanying drawings, in which:

Fig. 1 is a side view of the machine of the present invention;

Fig. 2 is a front view thereof;

Fig. 3 is a schematic side view showing the moving parts in their inoperative position; and

Fig. 4 is a view similar to Fig. 3 showing the moving parts in their operative position when a fur piece is being worked upon.

Broadly considered, the fur conditioning machine of the present invention comprises a frame generally designated A on which a fur conditioning member in the form of a conventional drum, generally designated B, is rotatably mounted. Fur feeding mechanism generally designated C is provided, this mechanism including a carriage D articulately mounted on the frame A so as to be movable toward and away from the drum B, and a pair of guides E and E' mounted on the carriage D and so positioned that when the carriage D is moved toward the drum B the guides E and E' will both tend to contact the outer surface of the drum B at separated points. An endless belt F is moved over the guides E and E' and is adapted to receive the fur piece 2 and convey the same over the drum B, which is normally rotated at a greater peripheral speed than the fur 2 moves thereover, thus achieving the desired conditioning action. A means generally designated G is provided for moving the guides E and E' toward the drum B, the connections between the means G and the guides E and E' being such that the operator, by controlling the force applied to the means G, will in turn control the pressure with which the fur piece 2 is pressed against the conditioning drum B. In order to facilitate working with large objects, a work supporting table H is employed, that table having an aperture J therein through which the guides E and E' and that portion of the endless belt F which moves thereover are passable.

The frame A includes bottom plates 4 and U-shaped side pieces 6 each having a short vertical arm 8 and a long and inwardly inclined arm 10, the drum B being rotatably mounted near the extremity of the arm 10. This drum may take the conventional form of a hollow body having a cylindrical external fur conditioning surface 12 provided with inclined deep notches or depressions 14. The drum B is heated in conventional manner and as a result the cylindrical surface 12 exerts a pressing action upon the fur piece 2. The notches 14, by agitating the fur fibres as the drum B is rotated, perform a brushing function. In some well known embodiments of the drum B, actual brushing elements in the form of bristles are applied to selected areas of the external surface 12 of the drum B. A motor 16 is mounted on the frame A and is operatively connected to the drum B to rotate the same by means of connections 18. The motor 16 may also operate a blower, the duct of which is illustrated at 20, for assisting in cleaning of the fur piece 2 as it is worked upon by the conditioning drum B.

The carriage D is here illustrated in the form of a pair of spaced members 22 each having a lower portion 24 pivotally mounted on shaft 26 which is journaled in the frame side pieces 6. It will be noted that the pivotal axis defined by the shaft 26 is positioned on the right hand side of the drum B as viewed in Fig. 1.

The other extremity of each of the members 22 is provided with a pair of fixed forked arms 30 and 32 at the ends of which are journaled the

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guides E and E' in the form of rollers 34. A bracket 36 is mounted on each of the members 22 at a point downwardly spaced with respect to the forked arms 30 and 32 and in this bracket a third guide in the form of roller 38 is journaled, the roller being fast on shaft 40 which projects out through one of the brackets 36 and is joined, by means of the universal connection generally designated 42, to a speed reduction gear assembly 44 which is in turn connected, by means of belt 46 and pulleys 48 and 50, to motor 52. Each of the brackets 36 is provided with a finger 54 and a screw 56 having a knurled head 58 is threadable therethrough, the tip of the screw engaging a lug 60 on the carriage member 22. The endless belt F is arranged to fit between the carriage members 22 and to pass over the three guides defined by the pair of rollers 34 and the third roller 38. The roller 38 is rotated by the motor 52 and causes the belt F to move over its guides. In order to ensure that adequate frictional contact exists between the belt F and the driving roller 38, and in order to accommodate for any stretching or slack which may develop in the belt F, the driving roller 38 is adjustably mounted on the carriage member 22 by means of the cooperation between the screws 56 and the lugs 60 on the carriage member 22. It will be apparent from an examination of Figs. 3 and 4 that as the screws 56 are moved through the fingers 54, the driving roller 38 will pivot away from the rollers 34 and thus take up any slack in the endless belt F.

It will be noted that the bulk of the carriage members 22 themselves, as well as the various apparatus secured thereto, are all positioned to the left of the axis of rotation of the drum B and to the left of the shaft 26 which defines the axis of rotation of the carriage members 22. Consequently, the fur feeding mechanism C which is made up of the carriage D, the guides E and E', and the endless belt F, will normally assume the inoperative position shown in Figs. 1, 2 and 3 in which the carriage members 22 have rotated in a counter-clockwise direction as far as they are permitted to do so. As a result, the guides E and E' and the endless belt F are spaced a considerable distance from the drum B.

The means G is provided for moving the fur feeding mechanism C, and in particular the guides E and E', toward and into contact with the drum B. The means G comprises a foot operated treadle 62 secured to levers 64 pivotally mounted between the upstanding portions 66 of the frame A. Links 68 are pivotally connected both to the levers 64 and the carriage members 22. Hence, a positive connection exists between the treadle 62 and the carriage member 22, the connection being such that depression of the treadle 62 from its position shown in Fig. 3 to that shown in Fig. 4 will cause the carriage members 22 to pivot against their own weight in a clockwise direction about the shaft 26, thus bringing the endless belt F, as it passes over the guides E and E', into contact with the fur conditioning surface 12 of the drum B. In order to assist in the motion from the position of Fig. 3 to the position of Fig. 4, tension springs 70 are employed secured at their lower ends to the carriage members 22 and engaging at their upper ends with screw hooks 72 which are passable through cross-piece 74 in the frame A, being fastened therein by means of nuts 76. Tension of the springs 70 is adjusted by means of the nuts 76 so as to permit the fur feeding mecha-

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nism C to normally assume the position illustrated in Fig. 3 but so as to partially counterbalance its weight in that position. Hence, movement of the fur feeding mechanism C to the operative position shown in Fig. 4 is facilitated. It will be apparent that by reason of the connection between the treadle 62 and the guides E and E', the pressure exerted by said guides E and E' against the drum B will be directly controlled by the pressure exerted on the treadle 62.

Mounted on the frame A by means of arms 78 is the work supporting table H, that table having a horizontal work supporting surface 80 positioned in front of the drum B and a downwardly inclined work supporting surface 82 also positioned in front of the drum B and dropping down therebelow. In its preferred form, the downwardly inclined surface 82 is interposed between the drum B and the guides E and E' when those guides are in their normal position illustrated in Fig. 3. The downwardly inclined surface 82 is provided with an aperture J, clearly shown in Fig. 2 as being of cut out shape, of such a size and particularly of such a width that the guides E and E' and the endless belt F passable thereover are freely movable therethrough from their normal inoperative position shown in Fig. 3 to their operative position shown in Fig. 4. Both the horizontal surface 80 and the downwardly inclined surface 82 are of a width greatly exceeding the width of the belt F and of the drum B so that a large coat may be supported on the table H while only a small proportion of its fur surface may be worked upon. Furthermore, because of the inclination of the surface 82, the portion of the fur body 2 not being directly acted upon by the drum B will feed downwardly by gravity in a more or less controlled manner, thus facilitating the feeding of that portion of the fur body pressed and into contact with the fur conditioning drum B. If no inclined surface be used to support the fur body, then all of its weight would act to pull the fur body through the machine at a more rapid rate than is proper, thus causing stretching of the garment and possible ripping of the lining where that lining makes contact with the endless belt F. By inclining the surface 82 to a moderate degree, optimum conditions of feeding are ensured, the weight of the fur body assisting the operator and the machine without in any way placing a strain either upon the garment or the operator.

The operation of the machine will in the main be apparent from the above description. The fur piece 2 is placed upon the work supporting table H and that portion of the fur piece which is to be worked upon is positioned in line with the drum B. The remaining portions of the fur piece 2 are supported by the horizontal work supporting surface 80. The motors 16 and 52 are started, the motor 16 rapidly rotating the drum B in the direction indicated by the arrows 84 of Figs. 3 and 4 and the motor 52 rotating the driving roller 38 so as to cause the endless belt F to move more slowly over its guides E and E' and 38 in the direction of the arrows 86 of Figs. 3 and 4. The operator then depresses the treadle 62, thus lifting the guides E and E' through the aperture J above the inclined work supporting surface 82. The fur piece 2 is moved forwardly until its underside makes contact with the moving belt F, the belt thereafter pulling the fur piece 2 along. Continued depression of the treadle 62 causes the belt F and the guides E

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and E' to force the fur piece 2 into contact with the rapidly revolving heated drum B. By controlling the amount of force exerted upon the treadle 62, the pressure exerted upon the fur piece 2 urging it into contact with the drum B can be controlled. By reason of the fact that the guides E and E' are spaced one from the other so as to make contact with the cylindrical surface 12 of the drum B at spaced points, the fur piece 2 is caused to conform to the periphery 12 of the drum B over a substantial area thereof, the belt F stretching sufficiently to permit such conformance of shape to take place. (Compare the straightness of the belt F between the guides E and E' in Fig. 3 with the curvature of the same belt F in Fig. 4.) As a result, the drum B acts upon a given portion of the fur piece 2 for an appreciable period of time, thus increasing the efficiency of the machine either by permitting an increased speed of passage of the fur piece 2 through the machine, thus increasing the capacity of the machine, or by providing more conditioning action for a given speed of passage of the fur 2 through the machine. During the time that the fur piece 2 is being moved through the machine by the endless belt F, both hands of the operator are free for guiding the fur piece 2 therethrough, and the operator is permitted to give his entire attention to the conditioning operation itself, since the remainder of the untreated portions of the fur piece 2 are supported by the work supporting table H. The operator can control the pressure between the fur piece 2 and the drum B and thus can modify that pressure as necessitated by the type of fur employed and the condition thereof. The operator is assisted in the performance of this function by the counter-balancing springs 70 which aid him in overcoming the weight of the fur feeding mechanism C and consequently reduce operator fatigue and render close pressure control feasible.

When one section of the fur piece 2 has been conditioned by the drum B, the treadle 62 is released by the operator and the weight of the fur feeding mechanism C, acting against the springs 70, causes that mechanism automatically to once again assume its position of Fig. 3, the springs 70 cushioning the shock of the return to inoperative position. The guides E and E' and the endless belt F passable thereover recede through the aperture J to a position below the inclined work supporting surface 82. Hence, without having to stop either of the motors 16 or 52, the fur piece 2 may be freely realigned or repositioned on the table H since the clearance between the table H and the drum B is quite adequate for that purpose and since the fur conveying endless belt F is positioned below the level of the table H. Once the fur piece 2 has been realigned, the operator need merely step once again upon the treadle 62 and repeat the conditioning operation.

By means of the above construction, an endless belt conveyor is provided which is self-conforming to the fur conditioning surface 12 of the drum B over a substantial area thereof and which therefore permits a substantial area of the fur piece 2 which is conveyed past the drum B by the belt F to similarly conform to the fur conditioning surface 12. This is accomplished without placing any excessive strains or tensions upon the undersurface of the fur piece 2. Consequently, if the fur piece 2 takes the form of a finished

coat with a lining, the machine of the present invention in no way tends to rip the lining or pull the lining from the coat, since the lining and the coat move together with one another and with the belt F, there being no slippage between any of the above elements.

While only one embodiment of the present invention has been here illustrated, it will be understood that the specific machine design may vary widely from the form here specifically shown, all within the spirit of the invention as defined in the following claims.

I claim:

1. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage articulately mounted on said frame so as to be movable toward and away from said drum, an endless belt movably mounted on said carriage, belt guiding means on said carriage so positioned as to tend to contact said drum at separated portions of said fur conditioning surface when said carriage is moved toward said drum, said belt thereby being pressed against a substantial area of said surface, means to move said belt over said guiding means, and means to rotate said drum at a higher rate of speed than said belt.

2. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage articulately mounted on said frame so as to be movable toward and away from said drum, an endless belt on said carriage, guiding means on said carriage over which said endless belt is movable, a portion of said guiding means being so positioned on said carriage opposite said drum that the endless belt movable thereover is pressed thereby against a substantial area of the surface of said drum when said carriage is moved toward said drum, means to move said belt over said guiding means, and means to rotate said drum at a higher rate of speed than said belt.

3. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage articulately mounted on said frame so as to be movable toward and away from said drum, a pair of guides on said carriage, an endless belt on said carriage movable over said guides, said guides being so positioned on said carriage as to tend to contact separated portions of said fur conditioning surface when said carriage is moved toward said drum, said belt thereby being pressed against a substantial area of said surface, means to move said belt over said guides and means to rotate said drum at a higher rate of speed than said belt.

4. In the fur conditioning machine of claim 3, a table on said frame having a work supporting surface in front of said drum, said table having an aperture opposite said drum of a size sufficient for said belt and said guides to pass therethrough when said carriage is moved toward said drum.

5. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage articulately mounted on said frame so as to be movable toward and away from said drum, a pair of guides on said carriage so positioned as to tend to contact separated portions of said fur conditioning surface when said carriage is moved toward said drum, a third guide rotatably mounted on said carriage, an endless belt movable over said guides, a motor, connec-

tions between said motor and said third guide to rotate the latter and thus move said belt over said pair of guides, and means to rotate said drum at a higher rate of speed than said belt.

6. In the fur conditioning machine of claim 5, a bracket pivotally mounted on said carriage, said third guide being rotatably mounted in said bracket, and an element adjustable in said bracket and engageable with said carriage for controlling the position of said third guide and thereby rendering adjustable the tension of said belt on said guides.

7. In the fur conditioning machine of claim 5, a work supporting table on said frame having a horizontal surface and a downwardly inclined surface between said carriage and said drum, said downwardly inclined surface having an aperture opposite said drum of a size sufficient for said belt and said pair of guides to pass therethrough when said carriage is moved toward said drum.

8. In the fur conditioning machine of claim 5, a table on said frame having a work supporting surface in front of said drum, said table having an aperture opposite said drum of a size sufficient for said belt and said pair of guides to pass therethrough when said carriage is moved towards said drum.

9. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage comprising a member pivotally mounted on said frame below said drum and having a pair of fixed forked arms close to said drum, a pair of rollers each rotatably mounted between corresponding forked arms so as to define a pair of guides, said rollers being so positioned as to tend to contact separated portions of said fur conditioning surface when said carriage is moved toward said drum, a bracket pivotally mounted on said carriage between said forked arms and the pivot point of said carriage, a third roller rotatably mounted in said bracket and defining a third guide, a screw threadable through said bracket and engageable with said carriage for controlling the position of said third roller with respect to said first mentioned pair of rollers, an endless belt movable over said rollers, a motor fixedly mounted on said frame, connections including universal links between said motor and said third roller for driving said roller and thus moving said belt over said guides, means for rotating said drum at a higher rate of speed than said belt, and manually operated means for moving said carriage and said belt toward and away from said drum.

10. In the fur conditioning machine of claim 9, a table on said frame having a work supporting surface in front of said drum, said table having an aperture opposite said drum of a size sufficient for said belt and said pair of rollers to pass therethrough when said carriage is moved towards said drum.

11. In the fur conditioning machine of claim 9, a work supporting table on said frame having a horizontal surface and a downwardly inclined surface between said carriage and said drum, said downwardly inclined surface having an aperture opposite said drum of a size sufficient for said belt and said guides to pass therethrough when said carriage is moved toward said drum.

12. A fur conditioning machine comprising a frame, a rotatable drum mounted on said frame and having a cylindrical fur conditioning surface, a carriage comprising a member pivotally mounted on said frame below said drum and on

one side of the axis of rotation thereof and having a pair of fixed forked arms close to said drum, at least one of said arms being on the other side of the axis of rotation of said drum, a pair of rollers each rotatably mounted between corresponding forked arms so as to define a pair of guides, said rollers being so positioned as to tend to contact separated portions of said fur conditioning surface when said carriage is moved toward said drum, a bracket pivotally mounted on said carriage between said forked arms and the pivot point of said carriage, a third roller rotatably mounted in said bracket and defining a third guide, a screw threadable through said bracket and engageable with said carriage for controlling the position of said third roller with respect to said first mentioned pair of rollers, an endless belt movable over said rollers, a motor fixedly mounted on said frame, connections including universal links between said motor and said third roller for driving said roller and thus moving said belt over said rollers, means for rotating said drum at a higher rate of speed than said belt, springs active on said carriage to tend to move it toward said drum but of a strength insufficient to move it unaided against the weight of said carriage, a manually movable element on said frame,

and positive connections between said element and said carriage, so that the pressure of said belt against said drum can be controlled through the degree of force manually exerted on said member.
SAMUEL FRIEDMAN.

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