Aug. 30, 1932. S. FRIEDMAN 1,874,273

FUR TREATING APPARATUS

Filed May 28, 1930

Fig. 1.

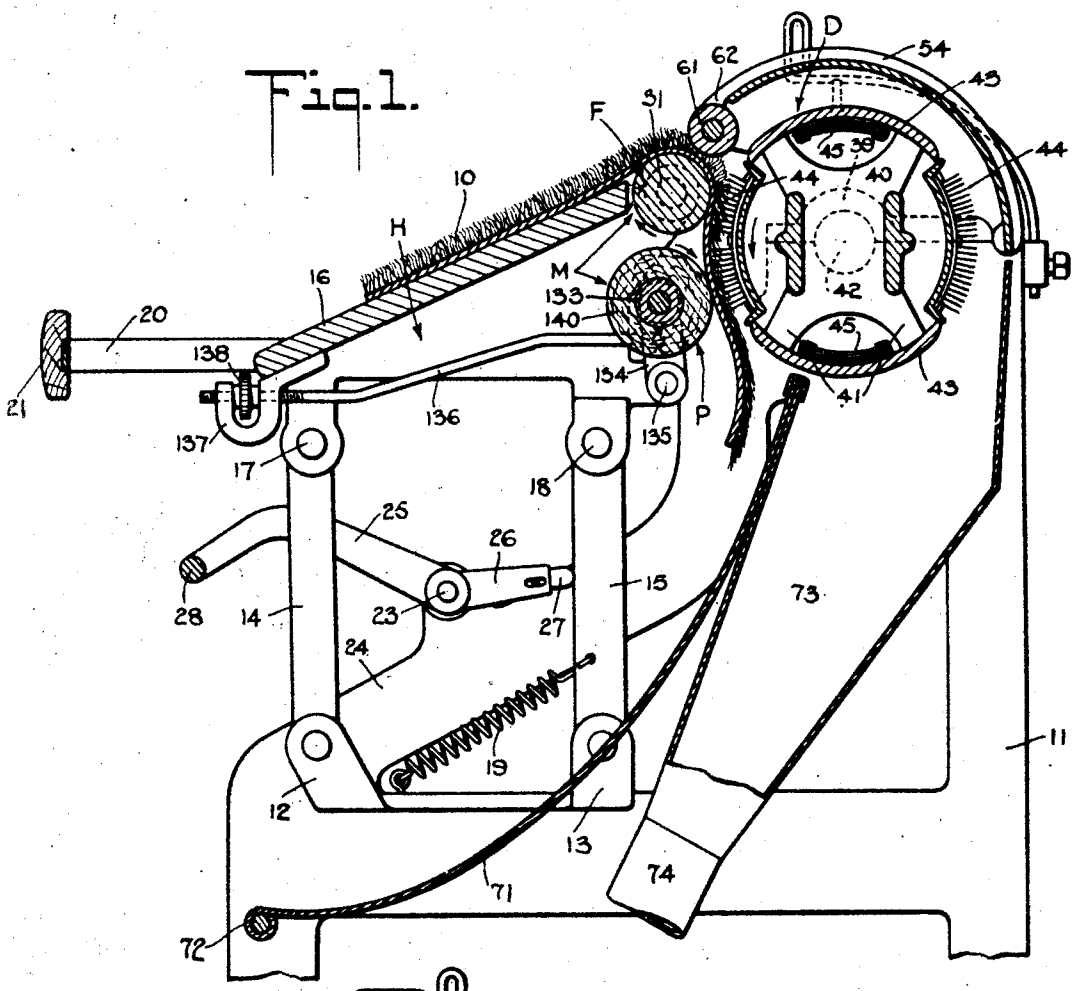
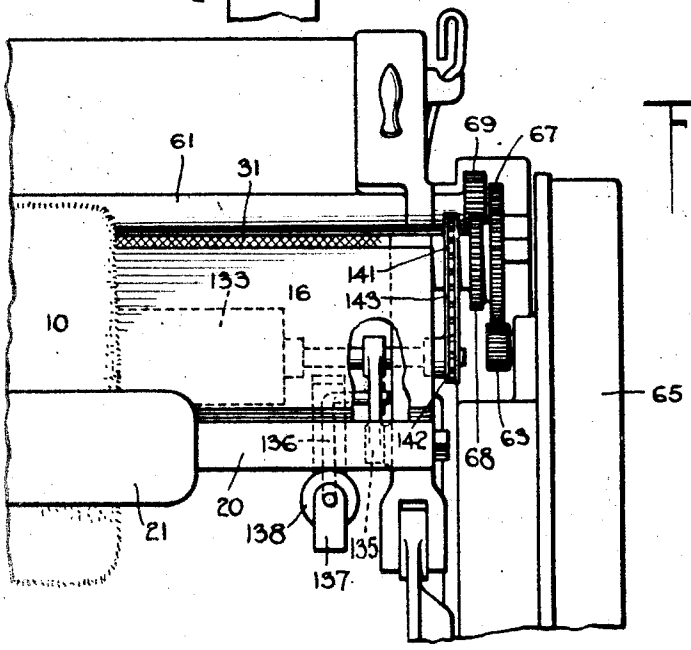


Fig. 2.



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UNITED STATES PATENT OFFICE

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FUR TREATING APPARATUS

Application filed May 28, 1930. Serial No. 456,825.

This invention relates to fur treating apparatus, and more particularly to machines for brushing and ironing furs and pile fabrics, and the like.

In my copending prior application Serial No. 340,844, filed February 18, 1929, since issued on Sept. 16, 1930 as Patent 1,776,114, I have disclosed an improved brushing and ironing machine for finishing furs and the like. In the said machine, the hair or nap of the fur or pile fabric is subjected to rapidly alternating brushing and ironing steps in continuous sequence, thereby combing, cleaning, ironing, and glazing the fur. The brushing and ironing members are arranged in alternating contiguity about the circumference of a rapidly rotated drum, and experience shows that with this arrangement a homogeneous high luster is uniformly obtained.

In my prior machine, the fur or pelt was held against the periphery of the brushing and ironing drum by an arcuately shaped stationary pressure plate. This plate was adjustable toward and from the drum in order to regulate the pressure with which the pelt was pressed against the periphery of the drum. This arrangement is satisfactory and produces excellent results, but I have found that with some skins the pressure affects the quality of the finished fur rather critically. While excellent results far superior to anything obtained prior to the use of my aforesaid machine may be obtained in spite of variations in pressure, still better results may be obtained when the pressure is adjusted nicely to the optimum value, and to do this under production conditions is very difficult because of the frequent and critical adjustment of the pressure plate which must be made. Accordingly, one primary object of my present invention is to overcome the foregoing difficulty and to greatly reduce the sensitiveness of the results obtained from the machine to variations in pressure adjustment.

In my prior machine the pressure plate was made arcuate in order to conform with the periphery of the rotatable drum. The correct arc is a function of the radius of curvature, and this is a variable, dependent upon the thickness of the skin being treated and the pressure with which it is applied to the drum, inasmuch as the pressure plate is moved to obtain the desired adjustment. Another primary object of my invention resides in the provision of feed means or/and pressure means for holding a pelt against the rotatable drum, which will permit the pelt to assume the correct arcuate configuration for accurately conforming to the periphery of the drum regardless of variations in the thickness of the pelt and in the pressure with which the pelt is held against the surface of the drum.

It has previously been mentioned that the drum carries on its periphery brushing and ironing members which are located in alternation and in contiguous sequence. The radius of the drum at these alternate members differs somewhat in order to obtain effective brushing and ironing contact with the fur. This difference is fixed, once the drum is mounted in the machine, but the relative brushing and ironing pressures, instead of being constant, are apt to be variable, depending, among other things, on the thickness of the skin and the length of hair or nap thereon. Still another object of the present invention is to so construct the feeding and pressure means that the pressure of the fur against the drum may be self-adjusting rapidly and automatically, so that the skin may accommodate itself to the successive brushing and ironing operations of the drum in spite of the high speed at which the drum is rotated.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the fur brushing and ironing machine elements and their relation one to the other as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by a drawing in which:

Fig. 1 is a section taken in elevation through a fur brushing and ironing machine embodying my invention; and

Fig. 2 is a fragmentary front elevation of the machine.

Referring to the drawing, the machine may

be considered in either of two aspects. First, the machine may be said to comprise, generally, a fur treating member represented by the rotatable drum D, a pivoted or oscillatable carriage forming work holding means H which is bodily movable toward and from the drum D, and multiple feed means M arranged to rotate at different peripheral speeds so as to tension the fur or pelt against the drum D. Considered in the second aspect, the machine comprises the drum D, the work holding means H, work feeding means F, and a pressure roller P which replaces the pressure plate heretofore employed and which is preferably rotated at a peripheral speed greater than that of the feed means F in order to tension the fur and so press the same against the drum D over the entire surface of fur between the feeding means F and the pressure or tensioning roller P.

Before describing the machine in detail, it may be mentioned that the present machine is, for the most part, and excepting only the pressure or/and tensioning roller P and associated mechanism, substantially identical with the fur brushing and ironing machine disclosed in my aforesaid copending application Serial No. 340,844, and reference may be made to the said application for details of the machine here thought immaterial and therefore not set forth. In fact, the reference numerals employed in the present specification are, so far as possible, identical with those employed in the prior application, like numbers indicating like parts, so that the manner in which the present improvement is applied to the prior machine may, if more detailed information is desired, readily be studied by reference to the prior application.

Again referring to the drawing, the machine comprises side frames 11 between which are pivotally disposed upwardly upon the brackets 12 and the brackets 13, pairs of legs 14 and 15, respectively, which support the work holder in the form of a work holding table 16 journalled pivotally on the legs 14 and 15 by the knuckles 17 and 18, the work table 16, legs 14 and 15 and supporting brackets 12 and 13 forming a structure, permitting bodily to and fro movement of the work holding table 16.

The bodily movement of the work table 16 is effected rearwardly by the coiled spring 19, anchored at one end in the bracket 12 and at the other end in the leg 15, against which spring action movement may be effected by the bar 20, having a wide rest 21 adapted to be engaged by the body of the operator. To prevent rearward tilting action of the work holding table, I provide a locking means or frame, pivotally mounted in the bearings 23 on the angularly disposed branch 24 of the frame. This locking frame comprises the lever members 25, whose inner ends 26 are hollow and in which hollow portions are mounted spring pressed plungers 27. These levers, two in number, provided adjacent each side of the frame 11, are caused to be operated in unison by the cross bar 28. It will be observed that rearward movement of the work table 16 is prevented by the plungers 27 engaging the legs 15. To forwardly lock the table, the cross bar 28 is pulled upwardly in a clockwise direction and when moved past the dead center, as shown, the work holding table is locked against movement rearwardly. The spring pressed plunger 27 also serves to resiliently hold the work table in its locked position with the work yieldingly held in position.

At the leading or forward end of the work holding table 16 there is mounted a feed roller 31. Below this, there is mounted a feed or/and pressure or/and tensioning roller 133. The bearings for the latter are carried at the upper ends of oscillatable arms 134 the lower ends of which are affixed in bearings 135 on the work holding frame. The position of each of the arms 134 is adjustable by movement of a rod 136 one end of which is pivotally anchored in the arm 134, and the other end of which is threaded and carried in a U-shaped bracket 137. A manually adjustable nut 138 is positioned between the legs of the U-shaped bracket, and rotation thereof moves the rod 136 and with it the arm 134 and the roller 133. In this manner, the pressure with which the pelt is applied to the drum, and also the tension to which the pelt is subjected when the roller is used as a tensioning means, may be varied.

The roller 133 preferably carries a relatively thick covering or shell 140 of a soft and yieldable material such as felt. This covering should be at least one-half inch thick, and may, as shown, be considerably thicker. In consequence, besides the give or yieldability of the entire work holding frame against the spring pressed plungers 27, the roller 133 is itself yieldable, so that pressure exerted thereby on the pelt is not critical.

For accomplishing the rapidly alternating brushing and ironing operations heretofore set forth, I provide a drum 40 positioned at the upper part of the frame, within the bearings 39, which drum is provided with spiders 41 having end shafts or trunnions 42 arranged to be disposed within the bearings 39 for rotation. The peripheral surface of the drum is provided with alternately spaced ironing plates 43 and brushes 44 arranged in contiguous relationship. Interiorly of the drum and adjacent the ironing plates 43, there are provided heating units 45.

Disposed upwardly of the drum 40, there is provided the arcuately formed hood 54. Frontally of the hood 54, there is disposed a feed roller 61, mounted for rotation within the bearings 62 in the extreme end of the hood. The feed roller 61 as thus provided

is arranged in the operation of the machine to be in contacting relation with the feed roller 31, mounted upon the work holding table previously described. The hood is preferably made of flexible material so as to be resilient and therefore adjustable to varying thicknesses of the fur.

The apparatus is provided with a stub shaft pinion or gear 63 driven by the electric motor, not shown, through the medium of a gear train contained within the cover 65. Meshing with the pinion 63, there is provided a gear 67 to which is affixed a pinion 68 fixed to an end of the feed roller 31. The pinion 68 is adapted to mesh with a pinion 69 on the feed roller 61 when the parts are in operative arrangement.

On the shaft of feed roller 31, and rotating with gears 67 and 68, there is fixed a sprocket gear 141. Another sprocket gear 142 is mounted on the end of the shaft carrying the pressure and tensioning roller 133. These sprocket gears are operatively connected by a chain 143. The chain and sprocket mechanism causes the tensioning roller 133 to be rotated when the feed roller 31 is rotated, and both are rotated in the same direction as they should be. As is evident from Fig. 1, the axes of rollers 31, 133, and bearing 135, are so related that adjustment of roller 133 toward or from the drum D only slightly alters the center to center spacing of rollers 31 and 133, and therefore of sprockets 141 and 142, and this slight variation is readily permitted by slackness in the chain 143.

The peripheral speed of the pressure roller 133 is preferably made greater than that of the feed roller 31 in order that the pelt may be placed in tension and therefore pressed against the periphery of the drum. The desired increase in peripheral speed may be obtained by either, or as in this case by both, of two expedients, first, increasing the diameter of the roller 133 relative to that of the feed roller 31, and secondly, increasing the diameter of the sprocket 141 relative to that of the sprocket 142. In the particular machine here in question, the peripheral speed of the tensioning roller 133 is made about three times as great as that of the feed roller 31, but it will be understood that the difference in peripheral speed may be varied over a wide range.

With this recited construction it will be seen that when the work table 16 is moved to the position shown, the gear 67 will move into meshing engagement with the pinion 63 and the gear 68 with the pinion 69 so that operation of the motor will result in rotating in unison the feeding and pressure rollers 31 and 61, respectively, and the tensioning roller 33. The drum 40 is also rotated by the gear train contained within the cover casing 65, the said drum 40 being rotated, as shown by the arrows, in the direction of feeding movement of the work fed by the feeding and pressure rollers. To accomplish the desired ends, the peripheral speed of the drum 40 is made very much greater than the peripheral speeds of the feeding and pressure or/and tension rollers 31, 61, and 33, respectively.

Below the work table 16 there is provided a work guiding apron 71, disposed below the drum 40 and the tension roller 33; and this is held in position upon the rod 72 and the upper edge of a dust hopper 73, which hopper is connected through a duct 74 to a suction fan, not shown.

For practicing my invention in connection with the apparatus just described, a fur piece or pelt, such as 10, is spread upon the work table 16 when the latter is in retracted position, the operator spreading the same upon this table and then bearing against the rest 21 until the table has been moved forwardly to cause the gears and pinions 68, 69, 63 and 67 to be in mesh. The locking frame is then brought to the locking position by lifting the bar 28 upwardly. If desired, the locking frame need not be used, operation being effected by pressure of the operator's body against the bar 21. With the apparatus in this position and the motor placed in rotation, one end of the pelt will be picked up by the feed roller 31 until it is squeezed between the said roller and the feed roller 61. At this point, the edge of the pelt is engaged by the rapidly rotating drum 40. The pelt is then fed downwardly over the feed roller 31 and soon reaches the tensioning roller 133 which keeps the pelt in direct contact with the drum and which causes the portion of the pelt between the rollers 31 and 133 to be pressed against the surface of the drum, the pelt taking the natural curvature of the drum, or, if it departs from the natural curvature, does so in such a manner as to automatically obtain the desired pressure of the fur against the drum. In actual operation, this results in a uniform pressure, and in fact seems to permit the pelt to flutter or vibrate very slightly so as to take the best natural pressure for the successive brushing and ironing steps, and it is found that skins treated in the present machine are given uniformly excellent finish and luster. The rotation of the drum is such that its peripheral speed is far greater than that of the linear movement of the pelt permitted by the feed roller 31 and the feed roller 61, so that the hairs of the pelt are submitted continuously in rapid succession, to the brushing and ironing treatment or action of the brushes 44 and the smooth surfaced ironing plate 43. During this action, the hopper 73 is activated by suction through the conduits 74 to draw in dirt or loosened hairs. The treatment is continued for the full length of the pelt 10 and this then drops upon the apron 71 and is gath-

ered by the operator in completely treated condition.

The construction and operation of my improvement in fur treating machines will, it is believed, be apparent from the foregoing description thereof. The present machine, while retaining all of the advantages of my prior machine, has the additional advantage of not being critical in the adjustment of the pressure roll and in permitting the fur to assume an arcuate shape best adapted to fit the brushing and ironing drum, and in allowing for variation in the position of the skin according to its thickness and texture and length of hair, and according to whether it is in contact with the brushing or ironing portions of the drum so that a more uniform pressure will exist during the entire treatment of the fur. In consequence of these advantages, different kinds of fur may be fed through the machine in rapid succession, without bothering to make adjustments when changing the kind of fur, and uniformly excellent results are nevertheless obtained.

It will be apparent that while I have shown and described my invention in the preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. A fur treating device comprising a rotatable drum for treating a pelt, means to feed a pelt past said drum comprising a plurality of feed rollers spaced apart adjacent the periphery of the drum, and means to positively rotate said feed rollers in the same direction at relatively different peripheral speeds so as to tension the pelt against the drum.

2. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, means to feed a pelt past said drum comprising a plurality of feed rollers spaced apart adjacent the periphery of the drum, means to rotate said feed rollers at relatively different peripheral speeds so as to tension the pelt against the drum, and means to rotate the drum at a peripheral speed very much greater than that of the feed rollers.

3. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, means to feed a pelt past said drum comprising feed and pressure rollers spaced apart about the periphery of the drum, pressure regulating means, means to rotate said rollers, and means to rotate the drum at a peripheral speed very much greater than that of the rollers.

4. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, means to feed a pelt past said drum comprising feed and pressure rollers spaced apart about the periphery of the drum, pressure regulating means, means to rotate said rollers in the same direction but at relatively different peripheral speeds so as to tension the pelt against the drum, and means to rotate the drum at a peripheral speed very much greater than that of the rollers.

5. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, a work holder mounted so as to be bodily movable toward and from said drum, means mounted on said work holder for feeding a pelt past said drum comprising feed and pressure rollers spaced apart about the periphery of the drum, means to rotate said rollers in the same direction so as to feed the pelt past and hold the pelt against the drum, and means to rotate the drum at a peripheral speed very much greater than that of the rollers.

6. A fur treating device comprising a rotatable member for treating the fur, work feeding means, a tensioning roller spaced from and following said feeding means, means to rotate said feeding means, and means to rotate said tensioning roller at a peripheral speed greater than that of the feeding means and in such direction as will tend to move the fur in the same direction as the feeding means.

7. A fur treating device comprising a rotatable member for treating the fur, work feeding means, a combined tensioning and pressure roller following and spaced from said feeding means about the periphery of the rotatable member, means for independently varying the position of the roller relative to the rotatable member in order to adjust the pressure therebetween, means to rotate said feeding means, and means to rotate said roller at a peripheral speed greater than that of the feeding means and in such direction as will tend to move the fur in the same direction as the feeding means.

8. A fur treating device comprising a rotatable member for treating the fur, a work holder mounted so as to be bodily movable toward and from said rotatable member, a feed roller mounted on said work holder, a tensioning roller spaced from and following said feed roller and mounted on said work holder, means to rotate said feed roller, and means to rotate said tensioning roller at a peripheral speed greater than that of the feed roller and in such direction as will tend to move the fur in the same direction as the feeding means.

9. A fur treating device comprising a rotatable member for treating the fur, a work holder mounted so as to be bodily movable

toward and from said rotatable member, work feeding means mounted on said work holder, a tensioning roller mounted on said work holder and spaced from and following said feeding means, said tensioning roller having a relatively thick covering of yieldable material, means for adjusting the pressure of the tensioning roller on the work, means to rotate said feeding means, and means to rotate said tensioning roller at a peripheral speed greater than that of the feeding means and in such direction as will tend to move the fur in the same direction as the feeding means.

10. A fur treating device comprising a rotatable member for treating the fur, a work holder mounted so as to be bodily movable toward and from said rotatable member, work feeding means mounted on said work holder, a combined tensioning and pressure roller mounted on said work holder and following and spaced from said feeding means about the periphery of the rotatable means, means for independently varying the position of the roller relative to the rotatable member in order to adjust the pressure therebetween, means to rotate said feeding means, and means to rotate said roller at a peripheral speed greater than that of the feeding means and in such direction as will tend to move the fur in the same direction as the feeding means.

11. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, work feeding means, a tensioning roller spaced from said feeding means, means to rotate said feeding means, means to rotate said tensioning roller at a peripheral speed greater than that of the feeding means, and means to rotate said drum at a peripheral speed very much greater than that of either the feeding means or tensioning roller.

12. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, work feeding means, a combined tensioning and pressure roller spaced from said feeding means about the periphery of the drum, means for varying the position of the tensioning roller relative to the drum in order to adjust the pressure therebetween, means to rotate said feeding means, means to rotate said roller in the direction as but at a peripheral speed greater than that of the feeding means, and means to rotate said drum at a peripheral speed very much greater than that of either the feeding means or the roller.

13. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, a work holder mounted so as to be bodily movable toward and from said rotatable member, a feed roller on said work holder, a tensioning roller spaced from said feed roller and mounted on said work holder, means to rotate said feed roller, means to rotate said tensioning roller at a peripheral speed greater than that of the feed roller, and means to rotate said drum at a peripheral speed very much greater than that of either the feed roller or tensioning roller.

14. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, a work holder mounted so as to be bodily movable toward and from said rotatable member, work feeding means mounted on said work holder, a tensioning roller mounted on said work holder and spaced from said feeding means, said tensioning roller having a relatively thick covering of yieldable material, means for adjusting the pressure of the tensioning roller on the work, means to rotate said feeding means, means to rotate said tensioning roller in the direction as but at a peripheral speed greater than that of the feeding means, and means to rotate said drum at a peripheral speed very much greater than that of either the feeding means or tensioning roller.

15. A fur brushing and ironing machine comprising a rotatable drum having brushing and ironing members arranged in alternating contiguity about the circumference of the drum, a work holder mounted so as to be bodily movable toward and from said rotatable member, work feeding means mounted on said work holder, a combined tensioning and pressure roller mounted on said work holder and spaced from said feeding means about the periphery of the rotatable member, means for independently varying the position of the roller relative to the drum in order to adjust the pressure therebetweeen, means to rotate said feeding means, means to rotate said roller at a peripheral speed greater than that of the feeding means, and means to rotate said drum at a peripheral speed very much greater than that of either the feeding means or tensioning roller.

Signed at Brooklyn in the county of Kings and State of New York this 24th day of May, A. D. 1930.

SAMUEL FRIEDMAN.