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H. H. TODD

2,184,132

BEATER

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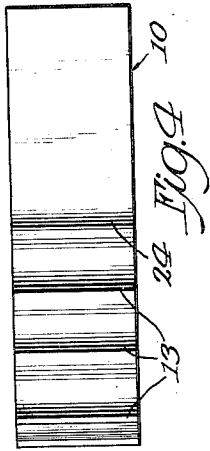


Fig. 4

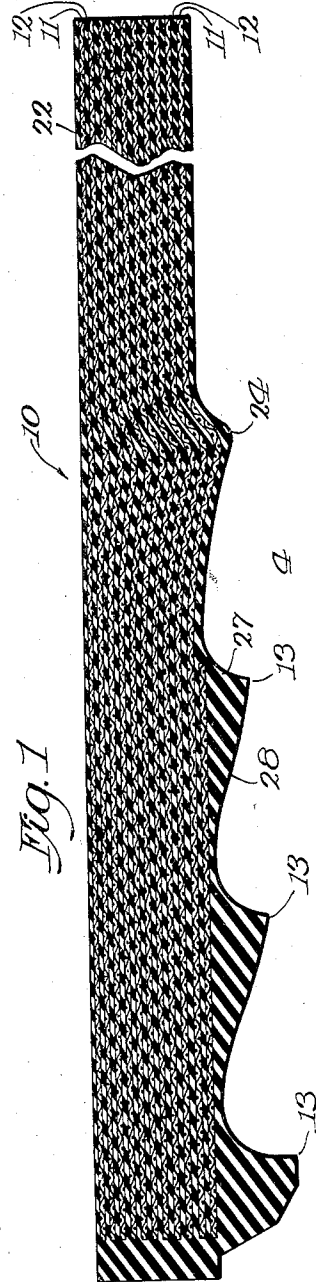
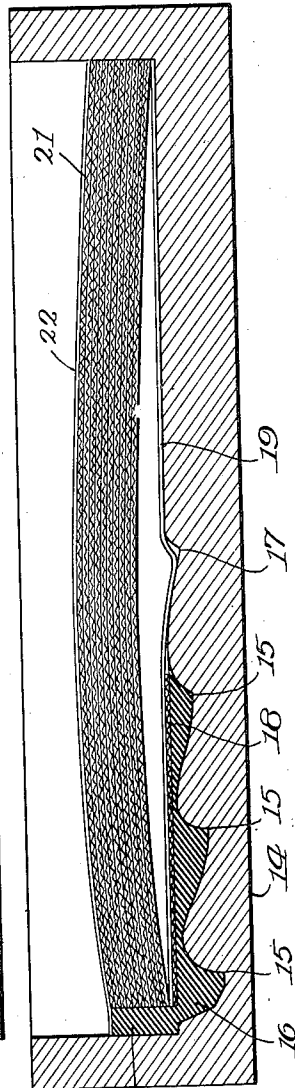
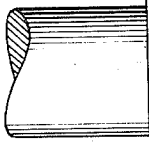


Fig. 1

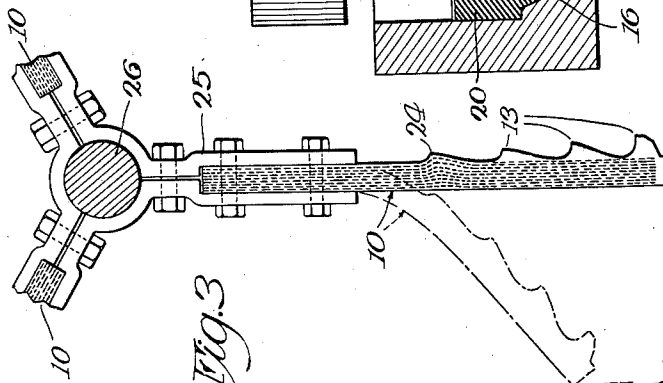


Fig. 3

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UNITED STATES PATENT OFFICE

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BEATER

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15 Claims. (Cl. 17—18)

My invention relates to beaters for scraping or dehairing machines such as are commonly used to dehair, clean and polish the carcasses of hogs.

Hog dehairing machines generally comprise a plurality of beaters which are appropriately clamped to a rotating shaft beneath which the carcasses are drawn. Each beater ordinarily is formed as a flexible, elastic arm provided with a number of scraping edges, usually of metallic construction, and when the carcass is in proper position the beaters are drawn across the surface of the carcass and pull the hair and bristles therefrom by frictional contact with the carcass surface, as well as removing scurf and imparting a polish to the surface of the animal.

Beaters heretofore in use have usually been made from a belting material such as layers of rubber and canvas or duck, to which are attached metal scraper elements. However, the life of such beaters is limited by their tendency to acquire a permanent set or to break at the point of bending and metal scrapers often cut or abrade the skin which reduces the sales value of the meat sections, particularly, the hams.

It is therefore one object of my invention to devise a flexible, elastic beater, free of metallic parts, whose life is increased considerably beyond current practice by a more efficient distribution of the stresses which are set up in the critical region of bending.

A further object is to provide a beater in which the dehairing elements are composed of a material, such as rubber, that is characterized by a capacity for exerting, relative to metallic scrapers, a greater pull on the hair and bristles and in which the elements are arranged for an improved and more effective cleaning action.

These and further objects of my invention will be set forth in the following specification, reference being had to the accompanying drawing, and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawing:

Figure 1 is a longitudinal, sectional elevation of my improved beater.

Fig. 2 is a sectional elevation of a die showing one stage in the manufacture of the beater.

Fig. 3 is a sectional elevation, showing the typical method of securing the beater to the shaft of a dehairing machine.

Fig. 4 is a view of the beater looking in the direction of the arrow 4 in Fig. 1.

Referring to Fig. 1, the numeral 10 designates

a beater strap composed of alternating plies of fabric and rubber 11 and 12, respectively. Associated with the strap is a plurality of dehairing elements in the form of rubber ridges 13 which, when the beater is appropriately mounted in the dehairing machine, operate to remove the scurf from the hide of the carcass, as well as hairs and bristles, and to also polish the skin, all without abrasion.

The manufacture of my improved beater preferably requires the use of a special type of die 14 whose internal rectangular dimensions conform closely to the corresponding dimensions of the finished beater and on the floor of the die adjacent one end thereof is formed a group of spaced depressions 15 which extend transversely of the die. The profile of the group corresponds to the profile of the finished dehairing ridges 13 and the first operation in the manufacture of the belt consists in placing in these depressions a premolded member 16 which is composed of rubber and which incorporates the ridges 13. The floor of the die 14 also includes a depression 17 which is located at a predetermined distance to the right of the right-hand depression 15, as viewed in Fig. 1, for a purpose presently explained.

A breaker strip 18 is then laid on the flat, upper surface of the member 16 and this strip is preferably composed of a fabric, such as ender cloth, that is characterized by a coarser weave than that of the fabric strips which comprise the body of the beater strap 10. A strip of rubber 19 is then laid on the breaker strip and extends toward the right along the floor of the die into abutting relation with the right end of the die, but this strip terminates short of the left end of the die and abuts against a vertical block of rubber 20 whose height approximates the thickness of the beater strap 10. Alternating plies of fabric 11 and rubber 12, each having a length greater than the distance between the opposing faces of the rubber block 20 and the right end of the die 14 are then inserted in the die and, because of the greater length, these plies assume the generally bowed shape indicated by the numeral 21 in Fig. 1.

Preferably, the alternating fabric and rubber strip construction is accomplished by initially calendering the opposite surfaces of the fabric strips with rubber. Moreover, it will be understood that any number of these plies may be employed as wrapping for the vertical stack of plies in accordance with the well-known practice in the manufacture of rubber belting.

A thin strip of rubber 22 having the width of the beater strap is then laid on the assembly of plies and overlaps the top surface of the rubber block 20.

The plunger member 23 is then forced downwardly into the die to thus flatten the bowed portion 21 and, owing to the presence of the depression 17, there occurs a slight endwise movement of the fabric and rubber plies toward the depression from both sides thereof. In this manner, the hump-like ridge 24 is formed. While the component elements are held in the indicated position, the assembly is vulcanized, or otherwise treated to form an integral structure.

In the use of the beater, the same is appropriately clamped, as indicated by the numeral 25 in Fig. 3, to a rotary shaft 26 forming part of a dehairing machine. This shaft rotates in a counterclockwise direction and, as the carcass is moved beneath the beaters, each beater in turn is drawn across the hide of the carcass, bending approximately as illustrated in Fig. 3. Each of the ridges 13, as well as the ridge 24, extends completely across the width of the beater and they preferably decrease in height from the free end of the beater inwardly toward the clamped end thereof, in order to provide for a more efficient cleaning and hair pulling action during the time that the beater is bent. The defining surfaces of each ridge 13 are preferably arranged so that one is more upright than the other, relative to the top, flat surface of the beater, as indicated by the numerals 27 and 28, respectively, in Fig. 1. This construction provides capacity for holding quantities of scurf and hair. Since the dehairing ridges are made of rubber, they exert a greater frictional pull on the hair and bristles than do metallic scraping elements and the former are also characterized by the important operating advantage of being incapable of cutting the hide of the carcass. The breaker strip 18 strengthens the bond connection between the member 16 and the remainder of the beater.

One of the important features of my improved beater resides in the hump-like formation 24 which is located in the region of critical bending when the beater engages a carcass. In effect, this formation provides an excess or reserve of material and, when the beater is bent by engagement with a carcass, the hump tends to flatten and so minimizes to a considerable extent the possibility of creating any rupturing strain in the beater strap.

Excessive strains are the principal reason for the relatively short life of present style beaters because, while the latter are ordinarily made of rubber belting and equipped with metal scrapers, and therefore possess flexibility and elasticity, abnormal strains and the poor distribution of stresses in such beaters serve to reduce their period of elastic usefulness. I have solved this problem by providing the hump 24 which enables the beater to bend as freely as present type beaters and repeatedly over a long period with a considerably reduced rate of loss of elasticity, compared to beaters now in use.

I claim:

1. A flexible, elastic beater adapted for securement to a rotary shaft comprising a plurality of elements for dehairing a carcass, one of which is a hump-like formation providing excess material for minimizing internal strain as the beater bends during engagement with a carcass.

2. A flexible beater adapted for securement to a rotary shaft comprising a strap formed of a

plurality of alternating plies of fabric and rubber secured together, and a plurality of dehairing elements fastened to the free end of the strap, the strap having a hump formed of bunched plies to provide excess material for minimizing internal strain in the strap as the latter bends during engagement with a carcass.

3. A flexible beater adapted for securement to a rotary shaft comprising a strap formed of a plurality of alternating plies of fabric and rubber, and a plurality of rubber dehairing elements, the plies and elements being vulcanized together and the strap having a hump formed of bunched plies to provide excess material for minimizing internal strain in the strap as the latter bends during engagement with a carcass, the hump constituting one of the dehairing element.

4. A beater for dehairing carcasses comprising a flexible, elastic strap, and a plurality of rubber dehairing ridges spaced inwardly from one end of the strap, the heights of the ridges decreasing successively from the free end of the strap.

5. A flexible, elastic beater for dehairing carcasses adapted for securement to a rotary shaft comprising a plurality of rubber dehairing elements, and a hump-like formation providing excess material for minimizing internal strain as the beater bends during engagement with a carcass.

6. A beater for dehairing carcasses comprising a flexible, elastic strap, and a plurality of rubber ridges integrally bonded to the strap and adapted to scrape a carcass.

7. A beater for dehairing carcasses comprising a flexible, elastic strap, and a plurality of non-abrasive, rubber ridges integrally bonded to the strap for scraping a carcass, the heights of the ridges decreasing successively from the adjacent end of the strap.

8. A beater for dehairing a carcass comprising a flexible, elastic strap, and a plurality of ridges for scraping a carcass, the sides of each ridge being formed by a pair of surfaces one of which is steeper than the other relative to the top surface of the strap and the steeper surface forming with the adjacent strap surface a pocket for holding scurf and hair.

9. A dehairing beater comprising an arm with projecting scraping blades, the arm and blades being of a single piece of rubberized material, said blades being of height progressively increasing towards the free end of the arm.

10. A dehairing beater comprising an arm and scraper blades of a single piece of rubberized fabric, the blades being of progressively increasing height towards the end and each having one abrupt face and an opposed oblique face.

11. A dehairing beater comprising a plurality of arms radially extending from a central rotatable shaft, each arm having scraping blades upon the face thereof, each arm and its blades being of a single piece of rubberized fabric, the blades being of increasing height towards the free end of the arm with abrupt faces towards the shaft and with gradually sloping faces in the opposite direction.

12. A dehairing beater comprising an arm with a projecting scraping blade, the arm and blade being of a single piece of rubberized material.

13. A dehairing beater comprising arms disposed about a rotary shaft and extending laterally therefrom, and beater blades carried by the free ends of the arms, each arm and its blades being of a single piece of yielding non-metallic material.

14. A dehairing beater comprising arms disposed about a rotary shaft and extending laterally therefrom, and forwardly facing beater blades forming the terminal portions of said arms, each arm and its blades being of a single piece of rubberized fabric.

15. A dehairing beater comprising an arm with a laterally projecting scraping blade, the arm and blade being of a single piece of rubberized fabric and the projecting blade having fabric therein.

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