APPLICATION FOR A STANDARD PATENT

We, THE MEAT INDUSTRY RESEARCH INSTITUTE OF NEW ZEALAND (INCORPORATED)
of East Street, Hamilton, New Zealand

hereby ask for the grant of a Patent of Addition for an invention entitled

ANIMAL PELTING SYSTEM

which is described in the accompanying Specification.

For a Convention application - details of basic application(s) -

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>COUNTRY</th>
<th>DATE OF APPLICATION</th>
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<tbody>
<tr>
<td>206314</td>
<td>New Zealand</td>
<td>18 November 1983</td>
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For an application made by virtue of section 51 -

I request that the Patent may be granted as a Patent of Addition

To Patent No. 534939 in the name of THE MEAT INDUSTRY RESEARCH INSTITUTE OF NEW ZEALAND (INCORPORATED)

I request that the term of the Patent of Addition be the same as that for the main invention or so much of the term of the patent for the main invention as is unexpired.

My address for service is SANDERCOCK, SMITH & BEADLE of 203 Riversdale Road, Hawthorn, Victoria, 3122, Australia

Dated this 19th day of November, 1994

(Signature)

BY: SANDERCOCK, SMITH & BEADLE

To be completed where application is made by a person other than the applicant for, or the patentee under, the patent for the main invention.

I, ____________________________ , hereby consent to this application.

Dated this _____________________ day of ____________________, 19 ____________

To: THE COMMISSIONER OF PATENTS

(Signature)
In support of the application made by THE MEAT INDUSTRY RESEARCH INSTITUTE OF NEW ZEALAND (INCORPORATED) for a patent for an invention entitled: Animal Pelting System

I/We JOHANNES VAN HARSKAMP
31 Devere Crescent
Hamilton, New Zealand

do solemnly and sincerely declare as follows:

1. (a) I am/we are the applicant(s) for the patent OR (b) I am authorized by the abovementioned applicant to make this declaration on its behalf.

2. (a) I am/we are the actual inventor(s) of the invention OR (b) DAVID EDWIN ANNAN of 20 Michael Avenue, Hamilton, New Zealand and JOHN COINILL RICHARDSON of 11 Laurence Street, Hamilton, New Zealand are the actual inventor(s) of the invention and the facts upon which the applicant(e) is/are entitled to make the application are, as follows:

3. The basic application(s) as defined by Section 141 of the Act was/were made in the following country or countries on the following date(s) by the following applicant(s) in New Zealand on 18 November 1983 by The Meat Industry Research Institute of New Zealand (Incorporated) on 19

4. The basic application(s) referred to in paragraph 3 of this Declaration was/were the first application made in a Convention country in respect of the invention the subject of the application.

Hamilton, New Zealand, this 16th day of February 1985

NO ATTESTATION OR SEAL

Signature(s) of declarant(s).

To: The Commissioner of Patents, Australia

SANDEROCK, SMITH & BEADLE, P.O. Box 410, Hawthorn, 3122, Australia
cables: Sandpat Melbourne
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This invention relates to the removal of a pelt or skin from
1. A method of removing the pelt or skin from a carcass of an animal which comprises the steps of working up the carcass so that the skin or pelt is removable from regions extending substantially from brisket regions to rump regions of the carcass, clamping with clamping means portions of the worked-up skin or pelt about the trunk of the animal at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass with the inside of the skin or pelt exposed, freeing the skin or pelt from the carcass over its trunk from the brisket region to the rump region by causing a mechanical device to be inserted between the skin or pelt and the carcass substantially to about the rump level of the trunk, maintaining the mechanical device at a position relative to the carcass and then causing a relative movement between the clamping means and said mechanical device.
7. Apparatus for the removal of the skin or pelt from the carcass of a slaughtered animal, said carcass being suspended from suspension means when in a worked-up condition so that the skin or pelt is removable from regions extending substantially from brisket regions to rump regions of the carcass, said apparatus comprising:

clamping means capable of holding worked-up skin or pelt at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass,
means capable of being insertable between said carcass and said skin or pelt when the same is clamped by said clamping means down to that level of the trunk of the carcass of which the rump forms part,
means to maintain said insertable means at a position relative to the carcass, and
means to cause a relative movement between the clamping means and said insertable means when said insertable means is held at said position relative to the carcass.
Complete Specification for the invention entitled:

ANIMAL PELTING SYSTEM

The following statement is a full description of this invention, including the best method of performing it known to me:

* Note: The description is to be typed in double spacing, pica type face, in an area not exceeding 250 mm in depth and 160 mm in width, on tough white paper of good quality and it is to be inserted inside this form.
This invention relates to the removal of a pelt or skin from the carcass of an animal and more particularly but not exclusively to the removal of a pelt or skin from the carcass of a sheep.

In our Australian Patent Specification No. 534939 there is described and claimed a method for removing the pelt or skin from the carcass of an animal which comprises the steps of working up the carcass so that portions of the worked-up skin or pelt can be clamped by clamping means at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass with the inside of the skin or pelt exposed substantially in a trunk-encircling manner. The skin or pelt is then freed from the carcass over its trunk from the brisket region to the rump region by causing a mechanical device to be inserted between the skin or pelt and the carcass substantially to about the rump level of the trunk, the mechanical device substantially encircling the trunk of the carcass during such insertion. A relative movement is then caused between (i) the carcass, and (ii) the skin or pelt, the clamping means and the mechanical device so as to withdraw substantially all, if not all, of the rear legs of the animal from the skin or pelt.

This method enables a mechanical means to be employed to remove the pelt or skin from the carcass of an animal in an hygienic and efficient manner. Development work has continued on the invention disclosed in the aforesaid patent specification with the result that improvements and modifications of the
previously disclosed method and means of pelt or skin removal
have been devised. These improvements and modifications will
hereinafter be described.

Broadly in one aspect the invention provides a method of
removing the pelt or skin from a carcass of an animal which
comprises the steps of working up the carcass so that the skin or
pelt is removable from regions extending substantially from
brisket regions to rump regions of the carcass, clamping with
clamping means portions of the worked-up skin or pelt about the
trunk of the animal at about the level of the brisket region so
as to hold the worked-up regions of the skin or pelt away from
the carcass with the inside of the skin or pelt exposed, freeing
the skin or pelt from the carcass over its trunk from the brisket
region to the rump region by causing a mechanical device to be
inserted between the skin or pelt and the carcass substantially
to about the rump level of the trunk, maintaining the mechanical
device at a position relative to the carcass and then causing a
relative movement between the clamping means and said mechanical
device.

Preferably the step of pre-tensioning the pelt or skin is
included between the steps of clamping the pelt or skin and
moving said mechanical device.

In the preferred form the carcass and mechanical device are
maintained in their relative positions whilst the clamping device
is moved to effect removal of the pelt or skin from the carcass.
In a less preferred form the clamping device is moved to clear the pelt or skin from both the front and back of the carcass to substantially the point of the crutch of the carcass, whereupon the clamping device is returned to substantially its starting point whereupon relative movement is caused between (i) the carcass, and (ii) the skin or pelt, the clamping means and said mechanical device so as to remove the skin or pelt from the carcass.

The present invention also provides a mechanical means whereby the method according to the invention can be carried out. Referring therefore to a second broad aspect of the invention there is provided apparatus for the removal of the skin or pelt from the carcass of a slaughtered animal, said carcass being suspended from suspension means when in a worked-up condition so that the skin or pelt is removable from regions extending substantially from brisket regions to rump regions of the carcass, said apparatus comprising:

- clamping means capable of holding worked-up skin or pelt at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass,
- means capable of being insertable between said carcass and said skin or pelt when the same is clamped by said clamping means down to that level of the trunk of the carcass of which the rump forms part,
- means to maintain said insertable means at a position relative to the carcass, and

worked-up skin or pelt can be clamped between said clamping
means to cause a relative movement between the clamping means and said insertable means when said insertable means is held at said position relative to the carcass.

In the following more detailed description of the method and means of removal of a skin or pelt from a carcass reference will be made the accompanying drawings in which:-

Figure 1 is a view of the carcass of a sheep which has been manually worked-up,

Figure 2 is a perspective view of one form of the mechanical device,

Figure 3 is a perspective view of a second form of the mechanical device,

Figure 4 is a perspective view of a third form of the mechanical device,

Figure 5 is a perspective view of a fourth form of the mechanical device,

Figure 6 is a perspective view of a fifth form of the mechanical device,

Figure 7 is a perspective view of a preferred form of the clamping device, and

Figure 8 is a perspective view of a form of a machine incorporating the mechanical device and clamping device.

Manual work-up on the carcass is carried out prior to the carcass entering the apparatus for removal of the skin or pelt. Such a worked-up carcass is shown in Figure 1 of the drawings and the working up is generally as follows. A Y-cut is made in the
pelt on the forequarter and the foretrotters are then cleared and pulled down to the top of the foreleg. The shoulders and side of the neck are then cleared following which there is clearing of the brisket and cheeks of the head whereupon the head is skinned. The foretrotters are then placed in a hock holder following which the foretrotters are removed. The hind trotters are then removed which leaves the carcass hanging from the foreleg joints in the hock holder. The pelt is then dropped off the back of the neck and cleared to the lower brisket level following which the pizzle button on rams and wethers is removed. With ewes and ewe lambs the wool piece over the udders is cut off. The pelt on the hind trotters is then split to allow sock inversion over the trotter joint and the head is placed in a head restraint attachment on the hock holder as shown in Figure 1. With the foregoing operations having been carried out the animal is dressed to the stage shown in Figure 1.

As disclosed in our Australian Patent Specification No. 534939 the portions of the worked-up skin or pelt are clamped with clamping means and then a mechanical device is inserted between the pelt and the carcass and moved down the carcass so as to free the skin or pelt from the carcass. In Figure 7 of the drawings there is shown a preferred form of the clamping means. This consists of a pair of arcuate cross-section body members 11 which are disposed in a spaced apart opposed relationship as shown to define an entry or mouth portion 12. The body portions 11 are mounted by shafts 13 in a carrier 14 and as will
hereinafter be described this carrier 14 is mounted to be movable in a substantially vertical up and down direction.

Means such as an hydraulic or pneumatic ram can be provided for movement of the body portions 11 away from one another so as to open up the mouth or entry portion 12 whereby a carcass can be moved into the clamping means so as to be disposed between the body portions 11. Alternatively, the carrier 14 is moved upwardly from below a carcass so that the body portions encircle the carcass thereby obviating the need to open entry portion 12. When the carcass is so positioned the clamping body portions 11 are moved back into their position to encircle the carcass.

Each body portion 11 is provided with a pair of outwardly projecting flanges 15 between which is vertically disposed an hydraulic or pneumatic ram 16. The piston rod 17 of the ram 16 is pivotally coupled to a link 18 which is pivotally coupled at its other end to a bifurcated mount 19. This mount 19 is attached to an arm 20 which is pivotally mounted by one end between the flanges 15. Mounted to the free end of arm 20 is a clamping segment 21 which can be movable upon actuation of the ram 16 from the position shown in the right hand side of Figure 7 to a position where it clamps against a corresponding clamping segment 22 on the upper peripheral edge of the body portion 11.

Accordingly with the worked-up carcass as shown in Figure 1 positioned within the confines of the clamp body portions 11 the ram 16 can be actuated by actuating switches 23 to cause the clamping segments 21 to move onto clamping segments 22 and
thereby clamp between the free portions of the pelt or skin which have previously been positioned over the clamping portions 22.

In Figures 2, 3 and 4 of the drawings, three forms of the mechanical device, or more commonly referred to as the pelting rings, are illustrated. The first form shown in Figure 2 is primarily designed for using with lambs and is conveniently constructed from stainless steel. The second form as shown in Figure 3 is also for use with lambs but is of a design suitable for manufacture from a plastics material such as an ultra high molecular weight polyethylene. In Figure 4 the pelting ring shown is suitable for construction from a metal such as stainless and is designed for use with sheep:

Each of the pelting rings as shown in Figures 2, 3 and 4 consists of two co-operating ring halves 25 and 26. Ring half 26 is pivotally mounted by one end to a bifurcated portion 25a of the other ring half 25. Ring half 25 is mounted by a pair of vertically disposed support rods 27 and via the movement of these rods the pelting ring can be moved in an upward and downward position. The free end of ring half 26 is engagable within a bifurcated end portion 25b of ring half 25 and is provided with a connecting member 28 which connects a vertically disposed control rod 29 to ring half 26. Via the control rod 29 (and member 28) the ring half 26 can be pivoted from a position as shown in Figure 2 to an open position whereby ring half 25 can be engaged with a vertically disposed carcass and the ring half 26 moved back into the closed position to complete the pelting ring preparatory to it being moved over the length of the carcass.
The pelting rings as shown in Figures 3 and 4 are of basically the same design as that previously described in relation to Figure 2, however, the configurations of the ring halves 25 and 26 are such as to suit the particular applications which the pelting ring is to be put. As previously stated the pelting rings of Figures 2 and 3 are designed primarily for lambs whilst the pelting ring of Figure 4 is for sheep. Other ring designs would be suitable and the designs as shown are by way of example only.

In Figure 5 there is shown a further form of the mechanical means suitable for separating the pelt or skin from the carcass. The mechanical device in this form does not consist in the operative configuration of an encircling but rather consists of a pair of separate elements 30 and 31 which are suitably shaped for the contours of the carcass, these elements being each supported by a vertically disposed support rod 32 and 33 respectively. These elements 30 and 31 which, with their support rods 32 and 33, can be referred to as punching arms have been found to be suitable for the separation of a pelt from sheep. The so-called punching arms offer the advantage that they can cater for a large variation in stock size but in addition it has been found that when using such an arrangement it is not necessary to clear the back of the neck and hang the head up on a holding device as shown in Figure 1.

Finally referring to Figure 6 there is a still further punching arm/pelting ring arrangement whereby the two punching
arm elements 30 and 31 in Figure 5 are extended and formed of a flexible polymer material so that the resultant punching arm/pelting ring arrangement 30a and 31a is of a flexible nature. As with the punching arm arrangement shown in Figure 5 each arm/ring portion 30a and 31a is supported by a support rod 32a and 33a. Like the punching arm arrangement the flexible punching arm/pelting ring as shown in Figure 6 provides the advantage of being able to cater for a large variety of stock sizes, however, the use of such a flexible arm/ring does require the carcass to be worked-up to the extent previously described and as shown in Figure 1.

In Figure 8 there is shown a pelting machine or apparatus usable for the mechanical removal of a pelt from a carcass according to the present invention. The apparatus generally consists of a carousel 35 which has a series of vertical guide arrangements shown generally at 36, these guide arrangements mounting a two part clamping means as shown in Figure 7 and a pelting ring or pair of punching arms. Both the two part clamping means and the pelting rings or punching arms are movable in a vertically up and down direction with the movement being controlled either pneumatically or hydraulically.

An animal carcass is transported on the hock holders as shown in Figure 1 into the machine as shown in Figure 8 tangentially from the manual work-up dressing chain. At the point where the carcass enters the effective working circumference of the machine the carcass engages with the back
portion 25 of the pelting ring and the front portion 26 pivots
around to engage with the back portion 25 so as to completely
encircle the carcass at the point of the brisket. The carcass
is then transported around the working circumference due to movement
of the carousel and the clamping means ascends around the carcass
stopping at a point where the cleared pelt may be easily clamped
between the clamping surfaces 21 and 22 such that the cleared
pelt is clamped away from the partially dressed carcass.

At a particular point on the working circumference as the
carousel rotates the clamping mechanism rises a predetermined
amount to apply tension to the pelt between the clamping surfaces
and the point where the cleared pelt remains attached to the
carcass. This pre-tension is applied to ensure the mechanical
removal of the pelt by the pelting ring is achieved so that the
pelt at the point of separation from the carcass is perpendicular
to the carcass surface. Preferably at this point a small amount
of liquid such as water is injected between the carcass fore-
quarter and pelt for lubrication whereupon the pelting ring
transverses a downward movement to a point level with the butt and
superficial inguinal lymph nodes. It is envisaged that at this
point a slight tension can be applied to the pelt by a relative
upward movement of the clamp. According to the method as disclosed
in our Parent Specification relative movement takes place
between the carcass on the one hand and the clamp mechanism (with
pelt) and pelting ring on the other hand, this action removing
the final portion of the pelt, i.e. that which is still
attached to the lower butt and hind legs. After pelt
removal has been completed the carcass is carried around the working circumference and leaves the machine at a fixed point where the clamp and ring mechanism have descended below the lowest point of the hind hocks and there is no hindrance for the exiting carcass. The pelt can then be split manually with the pelt splitting including the splitting of the main envelope from the brisket to the anus and also splitting the socks removed from the back legs.

In the method according to the present invention the machine operates as follows. The carcass enters the machine and each side of the cleared pelt is clamped as previously described. Also as previously described pre-tensioning of the pelt is initiated whereupon the pelting ring or more particularly the punching arms are driven down between the carcass and the tensioned pelt to a point adjacent to the butt and the superficial inguinal lymph nodes. The clamping mechanism then descends peeling the pelt away from the back and front of the carcass. The clamp can then continue its descent to pull the pelt off the hind legs. With this particular method it is possible to split the pelt prior to the initiation of the mechanical removal means and it is envisaged that this splitting could also be effected by the use of attachments so that splitting takes place automatically during the removal cycle.

In yet a further form of the method according to the present invention the carcass enters the machine, each side of the cleared pelt is clamped and the clamped pelt is pre-tensioned.
The pelting ring or more particularly the punching arms are then driven down to a point adjacent to the butt and superficialinguinal lymph nodes. The clamping mechanism then descends clearing the pelt from both the front and back of the animal to the point of the crutch. Once this has been completed the clamping means then moves back up to encircle the animal and stops at the original pre-tensioned position. Both the clamping mechanism and the punching arms then descend at the velocity to clear the final portion of the pelt off the hind legs. This particular form of the method is usable when, due to restrictions, there is limitation in the stroke of movement of the components in the machine.

Each of the methods described above can include a sterilization cycle between pelting operations. This can be performed immediately following the point where the cleared pelt is removed from the clamps.

Whilst the form of the apparatus shown in the drawings and described herein relates to a carousel type arrangement the body portions 11 of the clamping mechanism and the portions 25 and 26 of the pelting ring on the one hand or the individual elements 30 and 31 or 30a and 31a of the punching arms could be configured in a variety of ways.

The claims form part of the disclosure of this specification.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of removing the pelt or skin from a carcass of an animal which comprises the steps of working up the carcass so that the skin or pelt is removable from regions extending substantially from brisket regions to rump regions of the carcass, clamping with clamping means portions of the worked-up skin or pelt about the trunk of the animal at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass with the inside of the skin or pelt exposed, freeing the skin or pelt from the carcass over its trunk from the brisket region to the rump region by causing a mechanical device to be inserted between the skin or pelt and the carcass substantially to about the rump level of the trunk, maintaining the mechanical device at a position relative to the carcass and then causing a relative movement between the clamping means and said mechanical device.

2. The method according to claim 1 wherein the step of pre-tensioning the pelt or skin is included between the steps of inserting, clamping the pelt or skin and moving said mechanical device.

3. The method according to claim 1 or 2 wherein the carcass and mechanical device are maintained in their relative positions whilst the clamping device is moved to effect removal of the pelt or skin from the carcass.

4. The method according to claim 1 or 2 wherein the clamping device is moved to clear the pelt or skin from both the front and back of the carcass to substantially the point of the crutch of
the carcass whereupon the clamping device is returned to substantially its starting point following which relative movement is caused between (i) the carcass, and (ii) the skin or pelt, the clamping means and said mechanical device so as to remove the skin or pelt from the carcass.

5. The method according to any one of the preceding claims wherein the pelt is longitudinally split prior to clamping of the worked-up skin or pelt.

6. The method of claim 1 substantially as herein described.

7. Apparatus for the removal of the skin or pelt from the carcass of a slaughtered animal, said carcass being suspended from suspension means when in a worked-up condition so that the skin or pelt is removable from regions extending substantially from brisket regions to rump regions of the carcass, said apparatus comprising:

- clamping means capable of holding worked-up skin or pelt at about the level of the brisket region so as to hold the worked-up regions of the skin or pelt away from the carcass,
- means capable of being insertable between said carcass and said skin or pelt when the same is clamped by said clamping means down to that level of the trunk of the carcass of which the rump forms part,
- means to maintain said insertable means at a position relative to the carcass, and
- means to cause a relative movement between the clamping means and said insertable means when said insertable means is held at said position relative to the carcass.
8. Apparatus as claimed in claim 7 wherein the insertable means is a pair of oppositely disposed contoured elements positionable at opposite sides of the trunk of the carcass, said contoured elements, however, not encircling the trunk of the carcass.

9. Apparatus as claimed in claim 7 wherein the insertable means is a pair of oppositely disposed contoured elements positionable at opposite sides of the trunk of the carcass, the contoured elements being so dimensioned that they overlap one another and thereby encircle the trunk of the carcass.

10. Apparatus as claimed in claim 8 or 9 wherein the contoured elements are formed at least in part by a flexible polymer material.

11. Apparatus as claimed in claim 7 wherein said insertable means comprises a plurality of ring segments capable of being brought to encircle the trunk of the carcass and of being moved substantially in a mutually constant relationship.

12. Apparatus as claimed in any one of claims 7 to 11 further including means to cause relative movement between said clamping means and said carcass once said worked-up skin or pelt has been clamped by said clamping means to thereby apply a tension to the worked-up skin or pelt.

13. Apparatus as claimed in any one of claims 7 to 12 wherein said clamping means comprises a pair of arcuate cross-section body members capable of substantially encircling the trunk of the carcass, a clamping segment mounted by mounting means to each said body member, a clamping surface on each body member and moving means for moving said clamping segments from a position away from said clamping surface to a position whereby the
worked-up skin or pelt can be clamped between said clamping segment and said clamping surface.

14. Apparatus as claimed in claim 13 further including actuating means for movement of said body members toward and away from one another to permit a carcass to be located within and removed from the confines of the body members.

15. Apparatus for the removal of the skin or pelt from the carcass of a slaughtered animal substantially as herein described with reference to the accompanying drawings.

16. Apparatus for the removal of the skin or pelt from the carcass of a slaughtered animal substantially as herein described and incorporating insertable means in the form shown in Figures 2, 3, 4, 5 or 6 of the accompanying drawings.

17. The articles, things, parts, elements, steps, features, methods, processes, compounds and compositions referred to or indicated in the specification and/or claims of the application individually or collectively, and any and all combinations of any two or more of such.


THE MEAT INDUSTRY RESEARCH INSTITUTE OF NEW ZEALAND (INCORPORATED)

By its Patent Attorneys:
SANDERCOCK, SMITH & BEADLE