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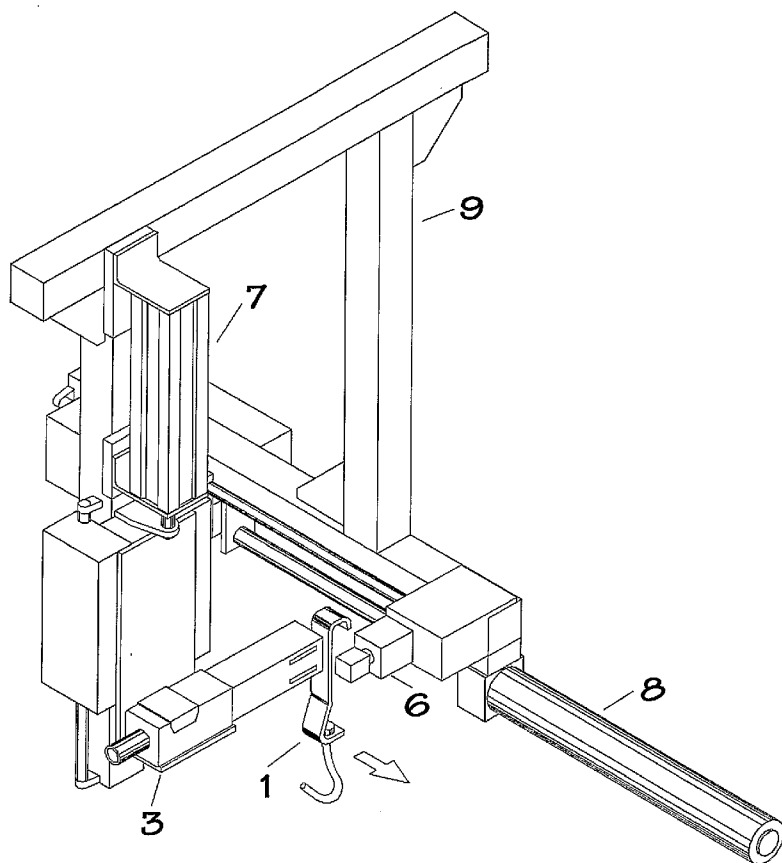
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(54) Title: IDENTIFYING CARCASS BY PRINTING DIRECTLY ON SKID, GAMBREL OR THE LIKE



(57) Abstract: The present invention provides a method and apparatus for automated carcass identification and tracking for use in the meat packing industry. The method of the present invention comprises obtaining information about an animal or carcass; printing the information directly on to a skid carrying the carcass; and optionally, reading the information. The invention also provides an apparatus for identifying a carcass during meat production along a meat production line, the apparatus comprising a means of obtaining information about an animal or carcass; a printing means for printing information directly on to a skid; a reading means positioned along the meat production line to read the information; a means of transmitting the information from the reading means to a database and processor; and a system for storing and retrieving the information.

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IDENTIFYING CARCASS BY PRINTING DIRECTLY ON SKID, GAMBREL OR THE LIKE

The present invention relates to an automated carcass identification and tracking system ("direct skid mark identification system") for use in the meat packing industry. The invention provides a tracking system that allows information relating to an animal carcass to be printed directly on the skid that holds the carcass throughout the different stages of meat processing.

Background of the invention

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Quality assurance systems are a key component of the meat processing industry. These systems provide market assurance, proof of origin of animal products, assurance of a disease-free state and the ability to trace animals back to the farm gate. One aspect of these systems is the identification and tracking of a carcass throughout all the stages of meat processing in a meat processing plant. In addition to providing information about the animal for quality assurance (such as animal origin), these identification and tracking systems can provide information about the operation of the meat processing facility. For example, specific identification of a carcass can enable the efficiency and performance of the meat processing plant to be monitored or can enable monitoring of the carcass to ensure that the meat has been properly handled and stored.

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A number of systems have been developed to address the problem of carcass identification and tracking within a meat processing plant. These systems may be based on a tag being physically attached to the carcass or based on permanent marking of a skid carrying a carcass.

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One tag-based system uses a paper label that is printed with carcass-specific information and attached to the carcass. Usually the information printed onto the paper tag comprises text and a barcode. The barcode encapsulates data including mob number, slaughter date, standard product ID (Standpack), weight and market eligibility. However, during meat processing, the paper labels can stick to the carcass or become folded. The paper labels are therefore rendered difficult to read in an automated system. In addition, it is time consuming and inefficient if the paper labels need to be manually attached to the carcass by an operator. There is also the possibility that the

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label may become separated from the carcass during processing, leaving the carcass unidentified.

Another tag-based system is described in WO 02/47485. This system utilises a band sized to fit around the limb of a carcass or around a gambrel (skid) used to support the carcass. The band comprises a means of identification, for example, a radio-frequency identification (RFID) tag. In addition to the possibility that the tag may become separated from the carcass, a RFID system has other specific disadvantages. These include the potential for RFID systems to be jammed. Jamming of the RFID system by energy at the right frequency is possible because RFID systems use the electromagnetic spectrum. Passive RFID tags, which are RFID tags that do not contain a battery, can be read only at short distances and the information on the tag cannot be updated. Active RFID tags require a battery to operate so may have a limited life span and are expensive.

Other tracking systems known in the art may use a plastic label attached to the skid and printed with a one dimensional bar code. However, as with labels attached to the carcass itself, these systems have the drawback that the label may be lost during processing.

Known systems for identification and tracking of an animal carcass by permanent labelling of a skid have also been described. Such systems may utilise, for example, permanent barcodes or a system of holes to provide a unique identifier for a skid. However, one problem with a permanent barcode system is that there is considerable debris, contamination, water, mineral oils, fats and other material which the skid is exposed to in the meat processing plant. This matter can land on the barcode and render it useless for scanning purposes. Identification systems based on a series of holes being punched into a skid to provide a unique identifier also have problems coping with the environment in a meat processing plant. The holes can become filled with debris. Often, the washing process employed in the meat processing plant is not robust enough to remove debris from the holes. The identification code is therefore rendered unreadable.

Alternate ways of permanently marking the skid include providing the skid with a magnetic stripe or embedded RFID. These systems can be compromised by the harsh conditions found in a meat processing plant. For example, some electronic labelling technology cannot withstand multiple cycles of extreme temperature

fluctuation (between -40 °C to +100 °C and may also encounter problems due to moisture and exposure to chemicals.

5 Finally, all systems that employ permanent marking of skids have the additional disadvantage that the carcass can only be associated with the identifier while the carcass is on the permanently labelled skid. That is, the identification system is inflexible because the same identifier is used for each new carcass that is placed on the permanently marked skid. Therefore, the identifier is not portable and the carcass cannot be traced back once it has left the plant.

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Prior art identification and tracking systems therefore suffer from several problems that reduce their efficiency and success rate for uniquely identifying a carcass. These include difficulty in maintaining the necessary equipment because of the adverse conditions found in meat processing plants, inability to read information because of debris or contamination, the potential for inefficiencies to be introduced to the processing line if an identification tag needs to be manually attached to the carcass or skid and potential for loss of information if the tag is separated from the carcass.

20 Therefore, it is an object of the present invention to provide a system that overcomes the limitations of the prior art, or which at least provides a useful alternative to known systems.

Summary of the invention

25 In a first aspect, the invention provides a method for identifying a carcass during meat production, the method comprising:

- obtaining information about an animal or carcass;
- printing the information directly on to a skid carrying the carcass; and
- optionally, reading the information.

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In a second aspect, the invention provides an apparatus for identifying a carcass during meat production along a meat production line, the apparatus comprising:

- a means of obtaining information about an animal or carcass;
- 35 a printing means for printing information directly on to a skid;

a reading means positioned along the meat production line to read the information;

a means of transmitting the information from the reading means to a database and processor; and

5 a system for storing and retrieving the information.

The means of obtaining information about an animal or carcass may include but is not limited to electronically receiving information from an external source, retrieving data from an ear tag or other data storage system physically attached to an animal, or
10 electronically receiving information gathered at different stages during meat processing.

The external source of information can be an animal management database maintained by a supplier or farmer or any other database containing information about
15 the animal. The ear tag or other data storage system physically attached to an animal may contain electronic data in a RFID tag, or data printed on a label in the form of a barcode or text. Information gathered at any stage of meat processing may be entered into and accessed from a database and processor, for example by way of serial communication, wireless transmission or a direct connection between the apparatus or
20 system of the present invention and the database and processor.

The information gathered for use in the present invention may include but is not limited to rules on hygiene, quality of animal feed, animal welfare standards, pest control records, animal health records, species, slaughter date, shift, carcass weight,
25 market, contamination, level of damage, wounds and bruises, disease, body number, mob number and/or state of the carcass (for example, chilled or frozen).

The information can be printed directly onto the skid in the form of a one- or two-dimensional bar code or in the form of human readable information. The human
30 readable information may be in the form of text or in the form of a symbol. The printing means may be an ink jet printer or marking laser. Preferably, the skid may be printed with a plurality of barcodes from different stages of the meat production process. The direct skid mark identification system of the present invention is capable of writing at least 12 skids per minute.

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The method and apparatus of the present invention can be used to print information onto either a fixed/static skid or onto a removable skid. Preferably, the method and apparatus of the present invention are compatible with existing meat processing technologies, for example existing conveyors and skids. Preferably, the data encapsulated in the information printed on the skid has a lifetime of the duration of the meat product processing, so that the data lasts from printing to skid washing. The information printed on the skid may be read at any stage of meat processing, including but not limited to during initial processing along the line, during storage of the carcass, or the skid may be read in a boning room for further meat part identification as the carcass is cut down into primal cuts.

The ink used in the present invention is non-toxic, quick drying, waterproof and dissolvable in detergent solution or other approved skid cleaning solution (for example, >2% alkaline solution). The ink can be any colour and is capable of printing on skids manufactured from standard materials such as stainless steel and plastic. The skid can be printed automatically while attached to the conveyor. Alternatively, the skid can be manually printed at a print station and placed on the conveyor. The method of the present invention can further comprise the step of washing the skid in detergent solution or other approved skid cleaning solution (for example, < 2% alkaline solution) to remove the printed barcode. The barcode is dissolved in the washing solution and the cleaned skid surface is then able to be printed with new information relating to a second carcass.

The means for reading information may be, for example, a barcode reader. The barcode reader may be adapted to read data from a highly reflective surface. Alternatively, the barcode reader may be adapted to read data from a plastic surface. The barcode reader may be capable of reading normal or negative printed barcode symbologies. Preferably, the barcode reader can read in low lighting conditions. The barcode reader for use in the present invention can read a barcode on a skid as the skid travels along the conveyer system at about 10 m per minute. Preferably, the barcode reader has a focal length such that it may be positioned at a distance from the skid to allow for readability if there is sideways movement of the skid. The barcode reader may be fixed or portable.

Preferably, the barcode reader has a means for assessing the barcode quality. The barcode quality assessment may be used to adjust the printing system. The

barcode reader may transmit information to a computer system by, for example, serial communications, wireless transmission or a direct connection. Preferably, the transmitted information may be stored and retrieved from a database in association with the identifying barcode number.

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It is to be understood that further aspects of the invention may become apparent from the following description with reference to the Figures given by way of example only.

10 **Brief description of the Figures**

Figure 1 shows an overview of the automated carcass identification and tracking system ("direct skid mark identification system") of the present invention.

15 Figure 2 shows one embodiment of the present invention, wherein the skid is locked in place, printed and then released.

Figure 3 illustrates the stage in meat processing where data for use in the present invention may be collected from an animal's ear tag when the animal enters
20 the slaughter floor.

Figure 4 illustrates the stage in meat processing where the carcass is transferred between conveyors. At this stage, the information contained on one skid may be transferred to another skid. This example illustrates the method of transferring
25 in an 'inverted dressing' conveyor system. The same may apply to a conventional conveyor system.

Figure 5 illustrates the stage in meat processing where the carcass is transferred from the static skid of the foreleg conveyor to the removable skid of the
30 main conveyor. At this stage, the information contained on one skid may be transferred to another skid.

Figure 6 shows another embodiment of the present invention, wherein the skid may have more than one two-dimensional barcode printed on it.

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Figure 7 shows another embodiment of the present invention, wherein the skid may have a single two-dimensional barcode printed onto it.

5 Figure 8 shows a skid that has been printed with a two-dimensional barcode, a one-dimensional barcode and human readable text according to the present invention.

Figure 9 shows a skid that has been printed with a plurality of two-dimensional barcodes and human readable text.

10 **Detailed description of the invention**

As used herein, the term "carcass" refers to the corpse of a slaughtered animal, and may include a whole corpse or a side of an animal.

15 As used herein, the term "skid" refers to both carcass hooks that are static or fixed onto a conveyor in the meat processing plant, and to removable hooks that can be placed onto and taken off the conveying system during meat processing.

20 As used herein, "one-dimensional barcode" refers to a series of vertical bars of varying widths, in which information is represented by a pattern of bars. A "two-dimensional bar code" refers to barcodes which consist of a grid of square cells rather than bars.

25 As used herein, the term "barcode reader" refers to a scanner, for example a laser scanner, capable of reading a one- or two-dimensional barcode.

The present invention provides a method for printing information about an animal or carcass directly onto a skid. Also provided by the present invention are a system and an apparatus for printing information about an animal or carcass directly
30 onto a skid.

Figure 1 provides an overview of the method of the present invention. In an initial step, a skid [1] which may be a static/fixed skid or a removable skid, receives a carcass [2]. A carcass [2] may be placed on a skid [1] at the bleed chain (static/fixed skid), the foreleg conveyor (static/fixed skid) or when the carcass [2] enters the main conveyor (removable skid). Regardless of whether the skid is a fixed/static or a
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removable skid, once the skid [1] has received a carcass [2], the skid [1] carrying the carcass [2] proceeds along the conveyor as it normally would within the plant. At the next stage, information specific to the carcass [2] is printed directly on to the skid [1] carrying the carcass [2] by a printing means [3], for example an ink jet printer or
5 marking laser. The information obtained and printed on the skid [1] may be in the form of a one- or two-dimensional barcode, or in the form of human readable information.

The information printed on the skid [1] may be read at any stage of meat processing as the carcass progresses through the processing plant. The information
10 on the skid [1] may be read by a reading means [4], for example a barcode reader, or, for human readable information, by a human operator. Optionally, additional information in the form of further one- or two-dimensional barcodes or human readable information may be printed on the skid [1] at various stages during meat processing, such that there may be a plurality of barcodes or human readable information on the
15 skid [1].

Once the carcass is removed from the fixed/static or removable skid [1], the empty skid [1] proceeds to the skid washing stage [5]. At this stage, the ink is removed from the skid [1] by washing with detergent solution or other approved skid cleaning
20 solution (for example, >2% alkaline) of the type normally employed in a meat processing plant. The skid [1] can then be reused and may be printed with new information relating to another animal carcass.

In the case of a static/fixed skid, the carcass may be transferred during
25 processing from that skid to another skid. If there is information printed on the first static/fixed skid, the information printed on that skid may also be transferred to the other skid when the carcass is transferred. In the case of a removable skid on the main conveyor, the carcass remains associated with the same skid throughout the different stages of meat processing until it is finally removed from the skid, for example
30 when the carcass arrives at the boning room, or if the carcass is sent outside the meat processing plant.

Figure 2 shows an apparatus of the present invention. The apparatus allows the skid [1] to be locked into place, printed on and then released. The skid [1] travels
35 along a skid advance cylinder [8] until it reaches a clamp and cylinder [6]. The clamp

and cylinder [6] are supported by a support structure [9], which also supports a vertical travel stroke [7] and a printing means [3], for example an ink jet printer.

5 The clamp and cylinder [6] locks the skid [1] in place, for example, by mechanical force. The printing means [3] is then moved vertically by the linear cylinder of the vertical travel stroke [7] and prints information on the skid [1], for example in the form of a barcode or human readable information. The skid [1] is released after printing and resumes movement along the conveyor system.

10 The method or apparatus of the present invention may be utilised to print information on a fixed/static skid or onto a removable skid. Examples of some of these embodiments are shown in Figures 3 to 5.

15 In the embodiment shown in Figure 3, the animal [10] enters the slaughter floor from the yard by way of a restraining conveyor [11]. Information may be obtained at this stage from the animal's ear tag [12] or other information storage system physically attached to the animal. The animal's ear tag [12] or other information storage system physically attached to the animal may be a RFID tag or a label comprising a barcode and/or text. Information may be retrieved from an RFID tag using any type of RFID tag
20 reader known in the art. Printed information on a label may be in the form of a barcode or text. The barcode may be read by any type of hand-held or fixed barcode scanner known in the art. In all cases, the information retrieved from the tag may be manually or electronically entered into a database and processor, for example, into the existing computer system of a meat processing plant for storage and later retrieval.

25 Once the animal [10] has entered the slaughter floor, the animal [10] is killed and placed onto a bleed conveyor static skid [14] which is part of the bleed chain [13]. At this stage, information from the tag may be retrieved from the database and processor by the apparatus or system of the present invention via a wireless or direct
30 connection and printed onto the static skid [14].

In another embodiment of the present invention the information can be transferred from one skid to another. In the embodiment shown in Figure 4, the carcass [2] moves along the bleed chain [13] on a bleed conveyor static skid [14]. The
35 carcass [2] is then transferred to the foreleg conveyor [16], which further comprises the foreleg conveyor static skid [15]. The foreleg conveyor static skid [15] may be printed

with information at this stage using the method of the present invention. The information printed on the foreleg conveyor static skid [15] may be obtained by transferring the information printed on the bleed chain static skid [14] to the foreleg conveyor static skid [15]. Alternatively, the foreleg conveyor static skid [15] may be printed with information gathered at an earlier point in meat processing and retrieved from a database/processor.

Figure 5 illustrates another embodiment of the present invention, in which the carcass [2] is transferred from the static skid [15] of the foreleg conveyor [16] to the removable skid [1] of the main conveyor [17]. The removable skid [1] may be printed while on the main conveyor [17], for example by the apparatus as shown in Figure 2, or may be printed at a workstation prior to being placed on the main conveyor [17].

Figures 6 and 7 show different embodiments of the present invention, in which the skid may be printed with one (Figure 7) or more (Figure 6) two-dimensional bar codes.

Figures 8 and 9 show skids printed with information according to the present invention. The skid can be printed with a combination of one- and two-dimensional barcodes and human readable text (Figure 8) or with a plurality of two-dimensional barcodes and human readable text (Figure 9).

In accordance with the embodiments of the present invention, information, for example in the form of barcode(s) may be applied or read at any stage of the carcass butchering and dressing process. The system also allows for more than one barcode to be printed onto the same skid, for example to incorporate information obtained from multiple stages of procession. This may include information gathered at stages such as in the detain line, at the weighing and grading station, or at entry into or exit from storage facilities.

The information about an animal or carcass used in the present invention may be obtained from an external source, for example, through electronic transmission of the information, by retrieving data from an ear tag or other data storage system physically attached to an animal, or by retrieving information gathered at different stages during meat processing.

The external source of information may be an animal management or similar database and may be received for example, by electronic mail. The ear tag or other data storage system physically attached to an animal may contain electronic data in a RFID tag, or data printed on a label in the form of a barcode or text. Information that is gathered at various stages of meat processing may be entered into and later retrieved from a database and processor. The information may be transmitted to the apparatus or system of the present invention from the database and processor by way of for example, serial communication, wireless transmission or via a direct connection.

A further source of information may be the fixed/static skid itself, which may already be marked with a permanent identifier. Because the direct skid mark identification is compatible with existing meat packing technologies, this permanent identifier on the fixed/static skid could be gathered as part of the information obtained for use in the present invention. For example, the permanent identifier on the static skid may be read by a scanner or reader or manually entered into a database and processor. The permanent identifier from the fixed/static skid may then be included with the rest of the information gathered about the carcass when the information is printed on another skid. This provides the ability to track back a carcass on a removable skid to previous stages in processing.

The information printed on the skid may comprise but is not limited to, rules on hygiene, quality of animal feed, animal welfare standards, pest control records, animal health records, species, slaughter date, identifiers from fixed/static skids, shift, carcass weight, market, contamination, level of damage, wounds and bruises, disease, body number, mob number and/or state of the carcass (for example, chilled or frozen). The data may be in fixed format or definable.

The database and processor may be any type of computer or computer system known to those skilled in the art, and it may store identification and tracking information associated with the carcasses from any stage of meat processing. In addition, a server or other computer system, for example, the existing computer system of a meat processing plant, may be integrated with the database and processor such that all information relating to the carcasses can be stored. This will provide management and staff the tools to track orders and processing in real time. For example, a boning room supervisor will be able to order carcasses on demand from the storage chillers. The carcass is transported to the boning room on the skid carrying the carcass-specific

identifier. The skid may then be read upon arrival at the boning room and the unique identifier incorporated into the identification systems employed in the boning room. Another use may be to provide information that can be transferred to the skin when it is removed from the animal. The skin is routinely sent offsite for further processing and the information provided by the system of the present invention may be used to provide information to the processor of the skin. The system may also be used to provide traceability for the viscera during processing once they are removed from the carcass by providing an identifier that links that viscera to the carcass.

10 The present invention also provides the possibility the printing means and/or the reading means may be portable.

15 The printing means, for example an ink jet printer, uses ink that is non-toxic, quick drying, waterproof and dissolvable in a detergent solution or other approved skid cleaning solution (for example, >2% alkaline solution) used at the skid washing stage. The printed information according to the present invention may be applied to the skid without interfering with the normal operation of the slaughtering and conveying process. The system of the present invention may be able to write at least 12 skids per minute.

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 The direct skid mark identification system is compatible with the existing technology used in meat processing plants, for example existing mechanical conveyor systems, skids, and computer infrastructure. The skid and conveyor systems used in the present invention may be any type of skid or conveyor system used in the art.

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 In summary, the present invention provides a method and apparatus allowing an animal carcass to be associated with an individual identifier throughout the meat production process. This is achieved by printing data about the animal carcass directly onto a skid carrying the carcass. The data may be printed in the form of a one- or two-dimensional barcode or in the form of human readable information. Because the carcass is attached to a skid throughout its passage through the meat processing plant, the information on the skid can be read and used to automate the conveying process or to enable automatic sorting to take place. The method and apparatus of the present invention provide a number of advantages over systems of the prior art. These advantages include that existing meat processing equipment can be used (for example, conveyors and skids) and the ink used to print the label is removed in the normal skid

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washing (cleaning) process, therefore the skids may be reused. In addition, the system is robust because the ink is water resistant and unaffected by changes in temperature or humidity, the skid can be read at any point along the conveying system and the reader employed in the system may assess the barcode quality. Therefore, the system
5 has low failure rate. Finally, the associated system software provides management and staff with the tools to track orders and processing in real time, and provides the ability to log and record skid movements to improve traceability.

While this invention has been described with reference to certain embodiments
10 and Figures, it is to be appreciated that further modifications and variations may be made to the embodiments and examples without departing from the scope of the invention.

What is claimed is:

1. A method for identifying a carcass during meat production, the method comprising:
5 obtaining information about an animal or carcass;
printing the information directly on to a skid carrying the carcass; and
optionally, reading the information.
2. The method of claim 1, wherein the information is obtained by electronically
10 receiving information from an external source, retrieving data from an ear tag or other
data storage system physically attached to an animal or electronically receiving
information gathered at different stages during meat processing.
3. The method of claim 2, wherein the external source of information is an animal
15 management database maintained by a supplier or farmer or is any other database
containing information about the animal.
4. The method of claim 2, wherein the ear tag or other data storage system
20 physically attached to an animal is an RFID tag or a printed label.
5. The method of claim 2, wherein the information gathered at any stage of meat
processing is entered into and accessed from a database and processor.
6. The method of claim 5, wherein the information is entered into and accessed
25 from the database and processor by way of serial communication, wireless
transmission or a direct connection from the database and processor.
7. The method of any one of claims 1 to 6, wherein the information is selected
30 from the group comprising rules on hygiene, quality of animal feed, animal welfare
standards, pest control records, animal health records, species, slaughter date, shift,
carcass weight, market, contamination, level of damage, wounds and bruises, disease,
body number, mob number, and/or state of the carcass.
8. The method of any one of claims 1 to 7, wherein the information is printed in the
35 form of a one-dimensional barcode, a two-dimensional barcode and/or human readable
information.

9. The method of claim 8, wherein the human readable information is in the form of text or a symbol.
- 5 10. The method of any one of claims 1 to 9, wherein the skid is printed with a plurality of barcodes at different stages of the meat production process.
11. The method of any one of claims 1 to 10, wherein the skid is automatically printed while attached to the conveyor.
- 10 12. The method of any one of claims 1 to 10, wherein the skid is manually printed at a print station.
13. The method of any one of claims 1 to 12, wherein the information is read using a barcode reader.
- 15 14. The method of claim 13, wherein the barcode reader transmits information to a computer system.
- 20 15. The method of claim 13, wherein the transmitted information is stored and retrieved from the computer system in association with the identifying barcode number.
16. An apparatus for identifying a carcass during meat production along a meat production line, the apparatus comprising:
- 25 a means of obtaining information about an animal or carcass;
a printing means for printing information directly on to a skid;
a reading means positioned along the meat production line to read the information;
- 30 a means of transmitting the information from the reading means to a database and processor; and
a system for storing and retrieving data.
17. The apparatus of claim 16, wherein the means for obtaining information is electronic receipt of information from an external source, retrieval of data from an ear tag or other data storage system physically attached to an animal or electronic receipt of information gathered at different stages during meat processing.
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18. The apparatus of claim 17, wherein the external source of information is an animal management database maintained by a supplier or farmer or is any other database containing information about the animal.
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19. The apparatus of claim 17, wherein the ear tag or other data storage system physically attached to an animal is an RFID tag or a printed label.
20. The apparatus of any one of claims 17 to 29, wherein the printing means prints information in the form of a one-dimensional barcode, a two-dimensional barcode and/or human readable information.
- 10
21. The apparatus of claim 20, wherein the human readable information is in the form of text or a symbol.
- 15
22. The apparatus of any one of claims 17 to 21, wherein the reading means is a barcode reader.
23. The apparatus of claim 22, wherein the barcode reader is adapted to read from a highly reflective surface.
- 20
24. The apparatus of claim 22, wherein the barcode reader is adapted to read from a plastic surface.
25. The apparatus of any one of claims 22 to 24, wherein the barcode reader is capable of reading normal or negative printed barcode symbologies.
- 25
26. The apparatus of any one of claims 22 to 25, wherein the barcode reader has a means for assessing the barcode quality.
- 30
27. The apparatus of claim 26, wherein the barcode quality assessment is used to adjust the printing means.
28. The apparatus of any one of claims 17 to 27, wherein the system for storing and retrieving data is a database and processor.
- 35

29. The apparatus of any one of claims 17 to 28, wherein the information is stored and retrieved from the system in association with the identifying barcode number.

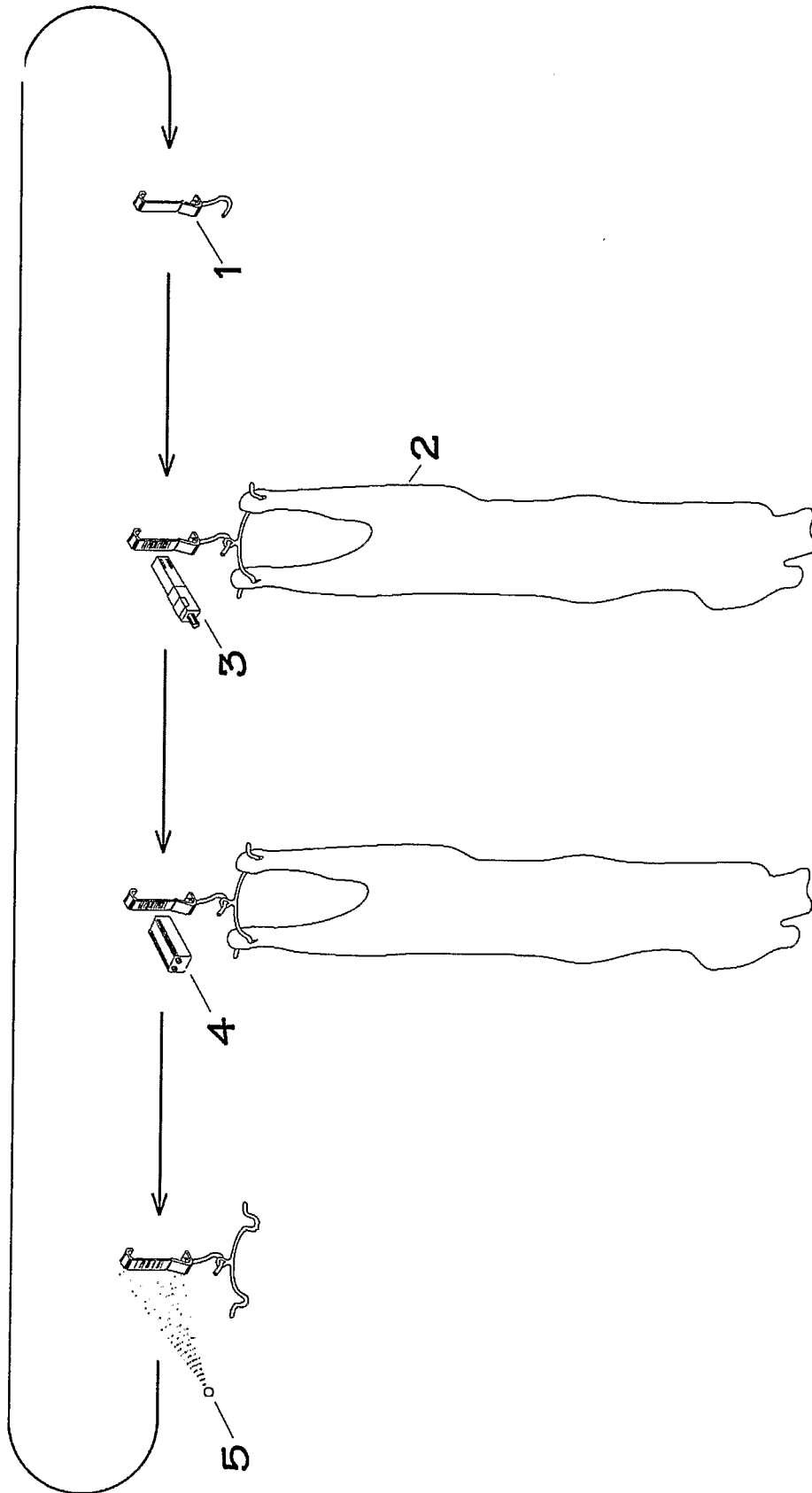


Figure 1

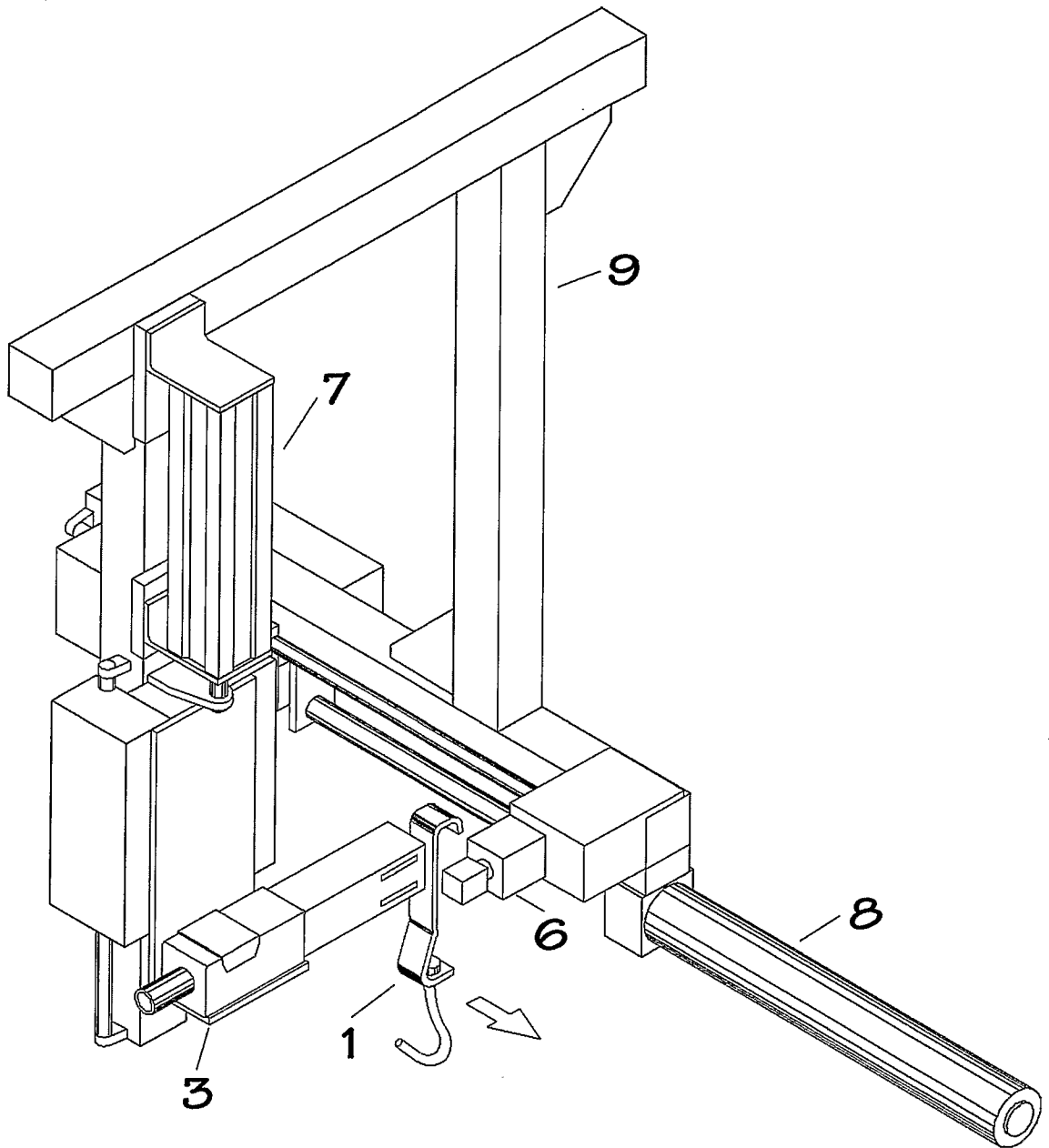


Figure 2

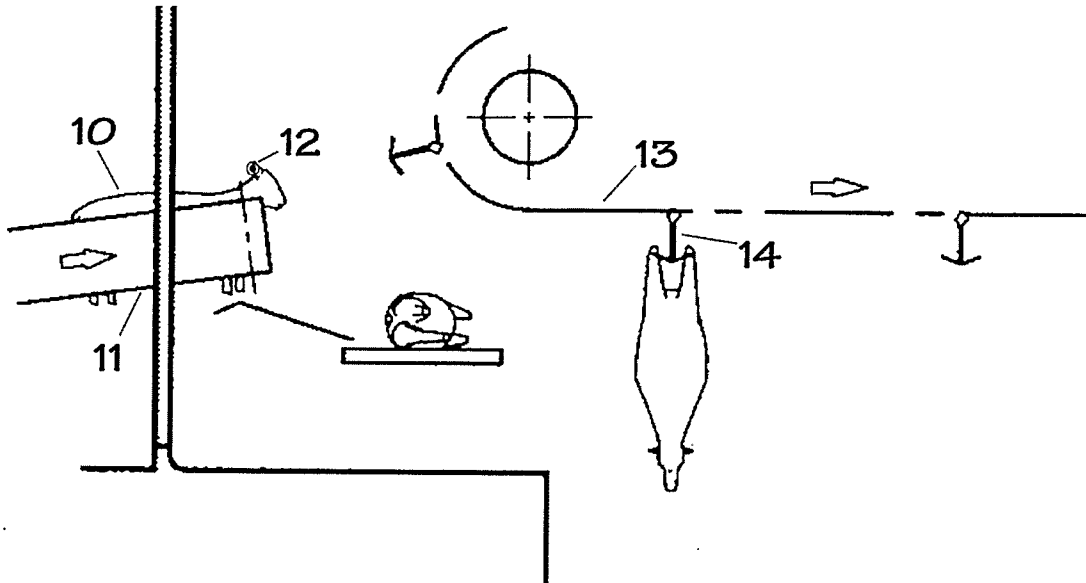


Figure 3

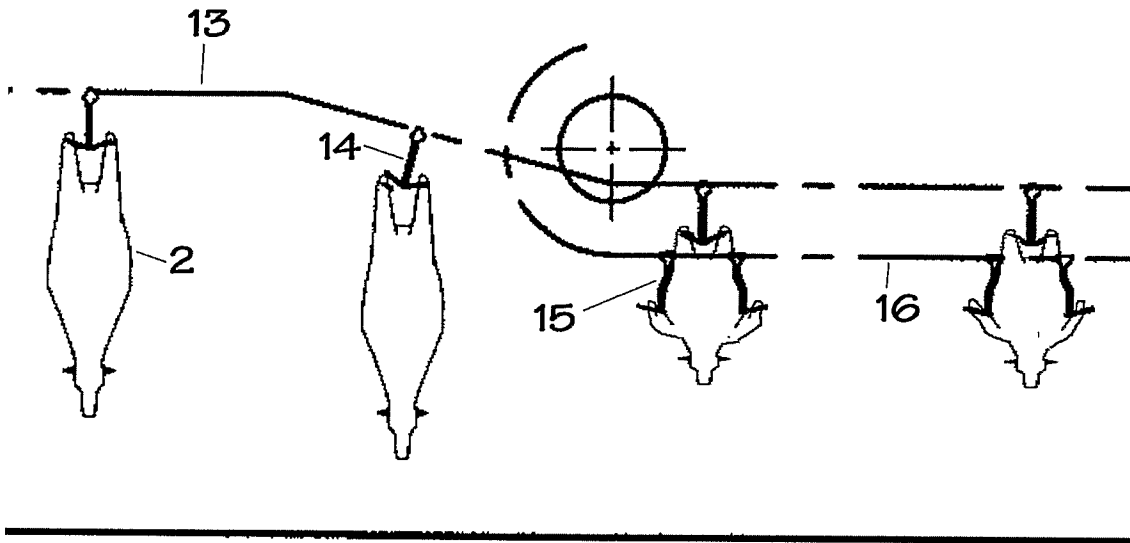


Figure 4

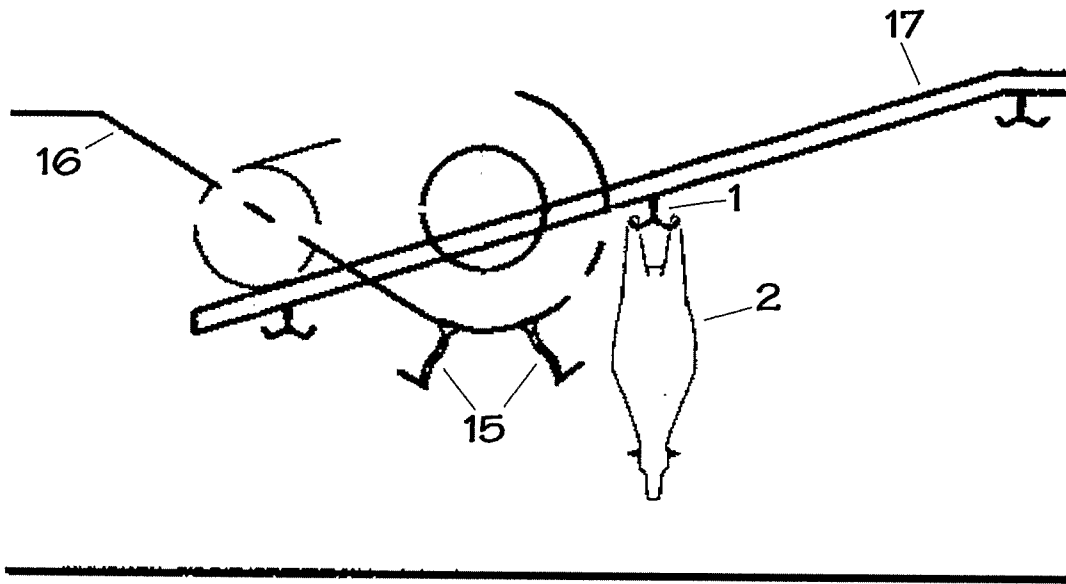


Figure 5

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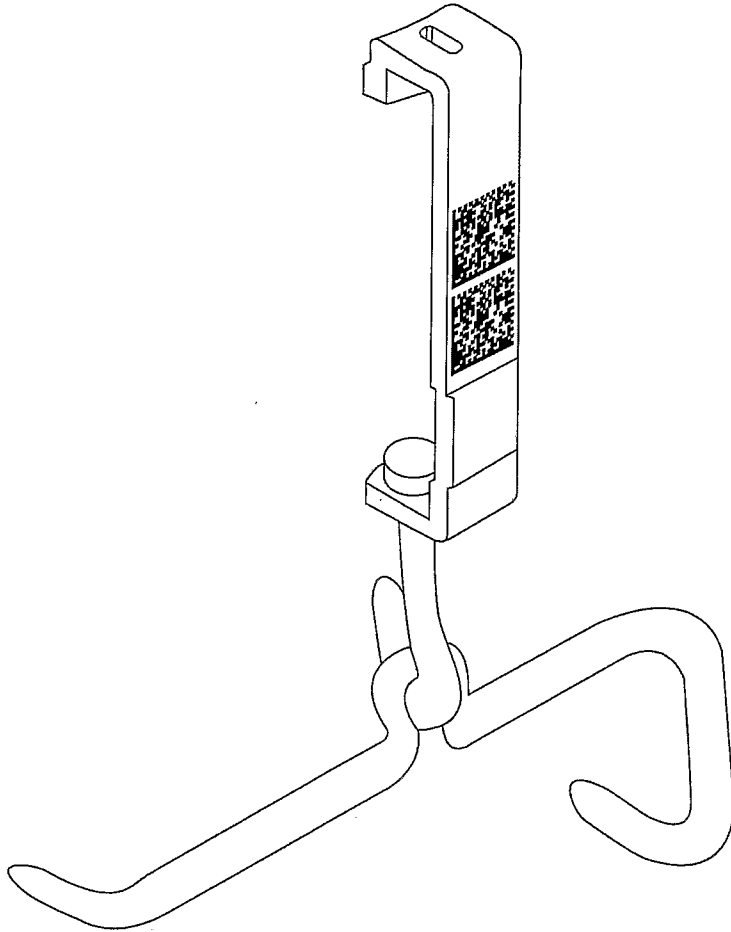


Figure 6

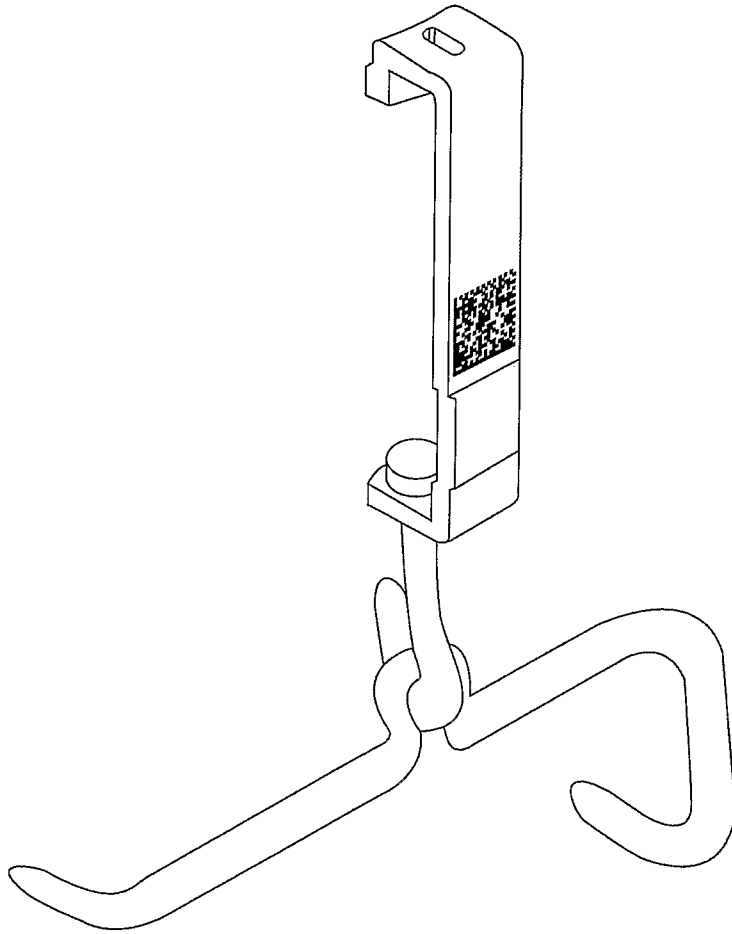


Figure 7



Figure 8

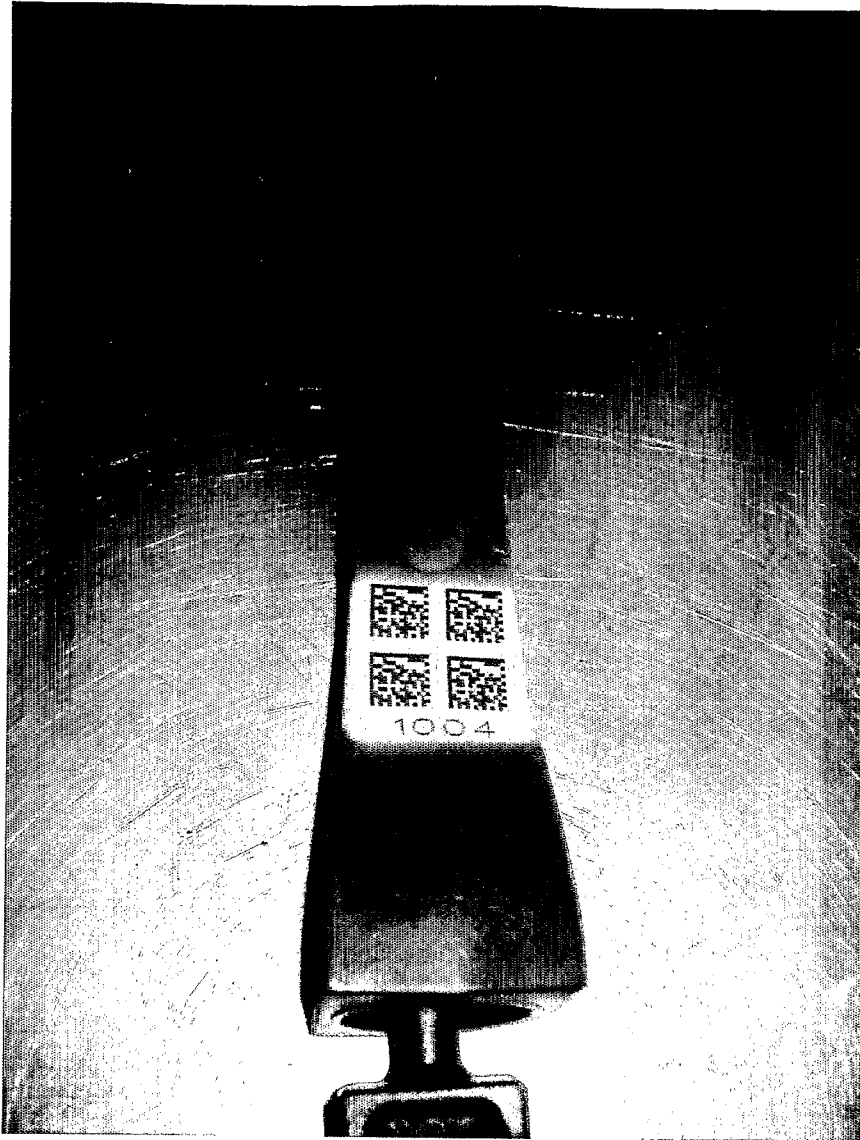


Figure 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ2007/000107

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. *A22B 5/00* (2006.01) *A22B 7/00* (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Refer to electronic data bases consulted below.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Derwent World Patent Index: using keywords only: meat, slaughter, carcass, poultry, animal, skid, carrier, gambrel, hook, trolley, strap, print, ink, mark and the like

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 4132830 A1 (BANSS MASCHINENFABRIK GMBH & Co KG) 8 April 1993 (& Derwent Abstract Accession No. 93-118372/15, Class D12, DE 4132830 A1 (BANSS MASCHFAB GMBH & CO KG) 8 April 1993) See whole of documents.	16-22, 26, 28-29
Y		1-29
Y	US 6148249 A (NEWMAN) See whole document, but in particular lines 12-45 of column 6.	1-29
A	DE 10110360 A1 (EGER) 12 September 2002 (& Derwent Abstract Accession No. 2002-668038/72, Class D12, DE 10110360 A1 (EGER) 12 September 2002) See whole of documents.	

Further documents are listed in the continuation of Box C

See patent family annex

* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"O" document referring to an oral disclosure, use, exhibition or other means

"&" document member of the same patent family

"P" document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search

13 August 2007

Date of mailing of the international search report

21 AUG 2007

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/NZ2007/000107

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
DE 4132830	NIL
US 6148249 EP 0820029	GB 2315584
DE 10110360	NIL

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX