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(71) Applicant: **OSCAR MAYER FOODS CORPORATION**
910, Mayer Avenue
Madison Wisconsin 53707(US)

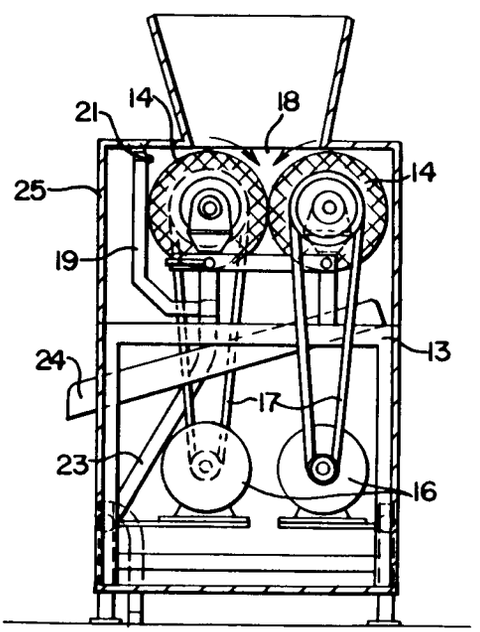
(72) Inventor: **Adkison, Frank L.**
111 West Patterson Street
Winfield, Iowa 52659(US)

(74) Representative: **Eyles, Christopher Thomas et al**
W.P. THOMPSON & CO. High Holborn House
52-54 High Holborn
London WC1V 6RY(GB)

(54) Metal mesh glove cleansing apparatus.

(57) A device (11) for cleansing metal mesh gloves (12) is provided in order to remove particles of meat or the like embedded within the metal mesh of the gloves. The device includes elongated rollers (14) which preferably counter-rotate with respect to each other and define an entry slot area (18) within which the gloves (12) are inserted for cleansing.

FIG. 2



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Background and Description of the Invention

The present invention generally relates to an apparatus for cleansing metal gloves of the type that are used in the meat processing industry or the like. More particularly, the invention relates to a cleansing apparatus having at least two generally parallel elongated rollers or brushes. A glove is passed at least partially into an entry slot area where the rolls counter-rotatingly engage the glove to cleanse it, preferably in cooperation with the flow of cleansing fluid directed onto at least one of the rollers.

In the meat packing and meat processing industries, as well as in related industries such as fish processing and the like, various cutting operations are performed either manually or semi-manually. In those instances, safety concerns dictate that the operator of the cutting equipment or device wear gloves that are made of a metal mesh material. While this metal mesh material does provide an extremely advantageous measure of safety, the metal mesh structure does create a difficult cleaning problem. Because of the expense of metal mesh gloves, it is undesirable to discard them until after they have been worn for long periods of time. Because the gloves are constantly in contact with food, it is important that they be effectively cleaned on a regular basis. Effective cleaning includes having meat and fish particles and the like displaced from out of the many crevices and spaces between the metal strips or fibers which make up the metal mesh gloves. This task is made more difficult by virtue of the fact that the meat or fish particles or the like tend to be or become sticky and thus have a strong tendency to remain lodged within the crevices or spaces.

In the past, high-pressure jets or flows of fluids such as air or pressurized water have been utilized in an attempt to force the particles out of the gloves by having the high pressure fluid dislodge the particles from these crevices. Often these cleaning operations are the responsibility of the user of the gloves, and there is a tendency for each user to use whatever means are available, such as sources of house air or pressurized water directed through high pressure nozzles, in an attempt to dislodge particles from within the mesh. Usually, these cleaning operations also include detergent cleansing and treatment with a chlorine solution or the like. Unless the meat particles are effectively removed, however, these liquid cleaning operations will be rendered potentially less effective if substantial quantities of meat or fish particles or the like remain in the groves at, for example, the time of treatment with a chlorine solution.

Accordingly, there is a need for an apparatus for cleansing metal mesh gloves or the like. It is preferred that such an apparatus be capable of being easily operated by the user of the metal mesh gloves and that the operation proceed in a safe and efficient manner. Also, while the use of high pressure fluids does have significant potential and has achieved a certain amount of success in the past, high pressure fluids do create a complication in having to provide the high pressure source and in having to handle the high pressure fluid during the cleansing operation. High pressure devices can lead to additional handling problems, such as how to handle particulate debris which can become airborne when subjected to a high pressure fluid. Therefore, it would be advantageous if an approach can be taken which avoids the need for high pressure fluids.

In summary, the metal mesh glove cleansing apparatus according to this invention includes a plurality of generally counter-rotating elongated roller brushes which provide an entry slot area for receiving metal mesh gloves. This entry slot area is provided and arranged such that the user of the metal mesh gloves can easily insert the gloves into the entry slot area. Then, the cleansing apparatus directs low-pressure fluid such as water to the entry slot area, and the combination of the fluid with the counter-rotating elongated roller members effectively removes the meat or fish particles or the like from the intersticies of the metal mesh glove, at which time the glove is suitable for treatment with a chlorine solution or the like in order to treat the thus cleansed metal in order to effectively reduce the chance of contamination or the onset of microbial growth.

It is accordingly a general object of the present invention to provide an improved apparatus for cleansing metal mesh gloves.

Another object of this invention is to provide an improved means for removing particulate food materials from metal mesh gloves used in handling these types of materials at processing plants.

Another object of the present invention is to provide an improved apparatus which accomplishes cleansing of metal mesh gloves and the like without requiring the use of high pressure fluid sources.

Another object of the present invention is to provide means for washing steel mesh gloves and the like in a very short time period and with minimal effort on the part of the operator of the device.

These and other objects, features and advantages of the present invention will be clearly understood through a consideration of the following detailed description.

Brief Description of the Drawings

In the course of this description, reference will

be made to the attached drawings, wherein:

Figure 1 is a perspective view of an apparatus in accordance with this invention, illustrating the use thereof;

Figure 2 is a transverse cross-sectional view of the apparatus illustrated in Figure 1;

Figure 3 is a longitudinal, vertical cross-sectional view of the apparatus illustrated in Figure 1; and

Figure 4 is a longitudinal, horizontal cross-sectional view of the apparatus illustrated in Figure 1.

Description of the Particular Embodiments

The device according to this invention is generally illustrated at 11 in Figure 1. Metal mesh gloves 12 are inserted into the device by a worker who suspends the gloves in an appropriate manner, such as by holding same by a glove wrist band or by any other convenient means such as by using a grasping device. Alternatively, the gloves 12 can remain on the worker's hands during the washing operation, in which event the gloved hands themselves are inserted directly into the device. In a typical operation, the gloves 12 are first dipped into a soap solution (not shown), they are cleanser within the device 11, and then they are dipped into a chlorine solution (not shown) which typically contains about 50 ppm of chlorine.

Device 11 includes a frame assembly 13 for supporting the various components of the device 11. Elongated rollers 14 are mounted on the frame assembly 13 in a manner such that the elongated rollers 14 are easily removable for cleaning and replacement as needed. A typical arrangement in this regard is to incorporate spring loaded shaft couplers 15. Suitable means are provided for driving each elongated roller. A suitable arrangement in this regard include the drive motors 16 and V-grooved drive belts 17.

It is important that the elongated rollers 14 be counter-rotating and preferably in the orientation of the arrows shown in Figure 2. With this arrangement, the elongated rollers 14 define an entry slot area 18 in which inwardly and downwardly oriented cleansing forces are exerted on each glove 12 present at the entry slot area 18.

It is preferred that each elongated roller 14 be in the form of a roller brush having generally radially extending nylon filament bristles or the like. It has been determined that, with elongated rollers of this general type, excellent and efficient cleansing is carried out when the counter-rotating elongated rollers each rotate at a speed of between about 400 and about 500 revolutions per minute. This has been found to be especially effective for removing poultry and red meat particles from steel mesh gloves.

The cleansing action of the counter-rotating elongated rollers 14 is enhanced by the inclusion of a low-pressure fluid supply assembly 19 which directs a fluid such as house water onto at least one of the rotating elongated rollers. A typical fluid supply assembly includes a plurality of exit openings or low-pressure nozzles 21, internal conduits 22 and a supply conduit 23 for communication with a desired supply of fluid (not shown) to be directed out of the exit openings 21.

For convenience, a discharge chute 24 is provided to collect the cleansing fluid discharged from the elongated rollers 14. Fluid overflow and the like is contained within the device 11 by providing removable stainless steel covers 25 which can be periodically disassembled and cleaned in accordance with standard industry procedures.

Use of the device according to the present invention, when initiated by immersion within a washing or detergent solution and when completed by immersion within a solution of chlorine or the like, accomplishes a cleansing function which is superior to previously used high pressure operations. Also, since the device takes a low-pressure approach, substantially less water or other cleansing fluid is needed than when high-pressure procedures are followed. In addition, the device is easily used, and a pair of steel mesh gloves can be fully cleansed within approximately three seconds. The invention significantly minimizes the spread of any possible contamination within a food processing plant such as a turkey processing plant.

It will thus be seen that the present invention provides a new and useful device for cleansing metal mesh gloves, which device has a number of advantageous characteristics, including those pointed out herein and others which are inherent in the invention. Preferred embodiments of the invention have been described by way of example, and it is anticipated that modifications may be made to the described form without departing from the spirit of the invention or the scope of the appended claims.

Claims

1. A metal mesh glove cleansing apparatus (11), comprising:

elongated roller means for receiving a metal mesh glove (12) and for cleaning the glove (12) including removing particles of meat, fish and the like embedded therewithin, said elongated roller means including at least two elongated rolls (14) which are generally parallel to each other;

frame means (13) for rotatably supporting each of said elongated rolls in a substantially longitudinally opposing manner in order to define an entry slot area (18) generally there-

between for receiving the metal mesh glove (12);

drive means (16, 17) for rotating said longitudinal rolls (14) in counter-rotation with respect to each other and generally toward and generally into said entry slot area (18); and

means (19) for providing a flow of cleansing fluid onto said elongated roller means;

each said elongated roll (14) being elongated in its axial direction and including a plurality of generally radially oriented bristles.

2. A cleansing apparatus according to claim 1, wherein said bristles include nylon filaments.

3. A cleansing apparatus according to claim 1 or claim 2, wherein said flow of cleansing fluid is at a pressure which does not substantially exceed house water pressure.

4. A cleansing apparatus according to any one of claims 1 to 3, wherein said cleansing fluid includes substantial amounts of water.

5. A cleansing apparatus according to any one of claims 1 to 4, wherein said elongated rolls (14) each have a generally horizontal axis and wherein said entry slot area (18) is generally defined by generally juxtaposed sections of substantially opposing elongated rolls, each said juxtaposed section being a longitudinal extending portion of a cylinder defined by less than half of one of said elongated rolls (14).

6. A cleansing apparatus according to any one of claims 1 to 5, wherein said means (19) for providing a flow of cleansing fluid includes conduits (22, 23) and exit openings (21) therefrom, said exit openings (21) being closely spaced from and directed toward an upper portion of at least one of said elongated rolls (14).

7. A metal mesh glove cleansing apparatus (11), comprising:

elongated roller means for receiving a metal mesh glove (12) and for cleaning the glove (12) including removing particles of meat, fish and the like embedded therewithin, said elongated roller means including at least two elongated rolls (14) which are generally parallel to each other;

frame means (13) for rotatably supporting each of said elongated rolls (14) in a substantially longitudinally opposing manner in order to define an entry slot area (18) generally therebetween for receiving the metal mesh glove (12), said entry slot area being generally defined by generally juxtaposed sections of the elongated rolls (14), each said generally juxtaposed section being a longitudinally extending portion of a cylinder defined by not greater than a longitudinally sectioned half of one of said elongated rolls (14);

drive means (16, 17) for rotating said longitudinal rolls (14) in counter-rotation with respect to each other and generally toward and generally into said entry slot area (18); and

means (19) for providing a flow of cleansing fluid onto said elongated roller means;

each said elongated roll (14) being elongated in its axial direction and including a plurality of generally radially oriented bristles.

8. A cleansing apparatus according to claim 7, wherein said bristles include nylon filaments.

9. A cleansing apparatus according to claim 7 or claim 8, wherein said means (19) for providing a flow of cleansing fluid includes conduits (22, 23) and exit openings (21) therefrom, said exit openings (21) being closely spaced from and directed toward an upper portion of at least one of said elongated rolls (14).

10. A metal mesh glove cleansing apparatus (11), comprising:

elongated roller means for receiving a metal mesh glove (12) and for cleaning the glove (12) including removing particles of meat, fish and the like embedded therewithin, said elongated roller means including at least two elongated rolls (14) which are generally parallel to each other;

frame means (13) for rotatably supporting each of said elongated rolls (14) in a substantially longitudinally opposing manner in order to define an entry slot area (18) generally therebetween for receiving the metal mesh glove (12), said entry slot area (18) being generally defined by generally juxtaposed sections of the elongated rolls (14), each said generally juxtaposed section being a longitudinal extending portion of a cylinder defined by not greater than a longitudinally sectioned half of one of said elongated rolls (14); and

drive means (16, 17) for rotating said longitudinal rolls (14) in counter-rotation with respect to each other and generally toward and generally into said entry slot area (18); and

each said elongated roll (14) being elongated in its axial direction and including a plurality of generally radially oriented bristles which include nylon filaments.

FIG_2

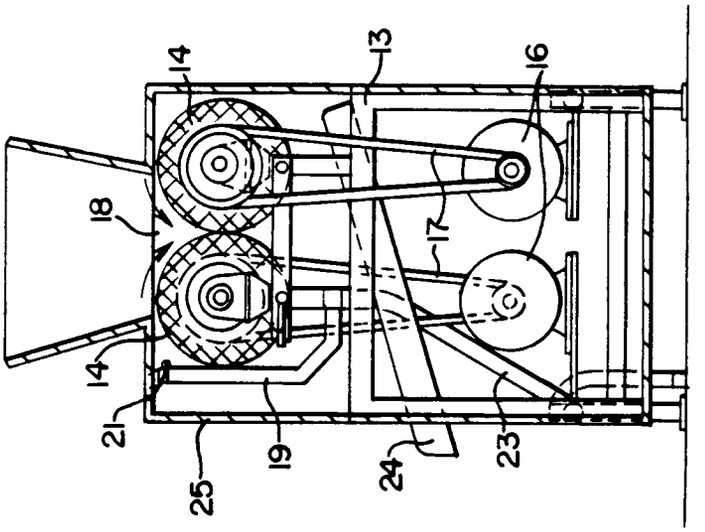
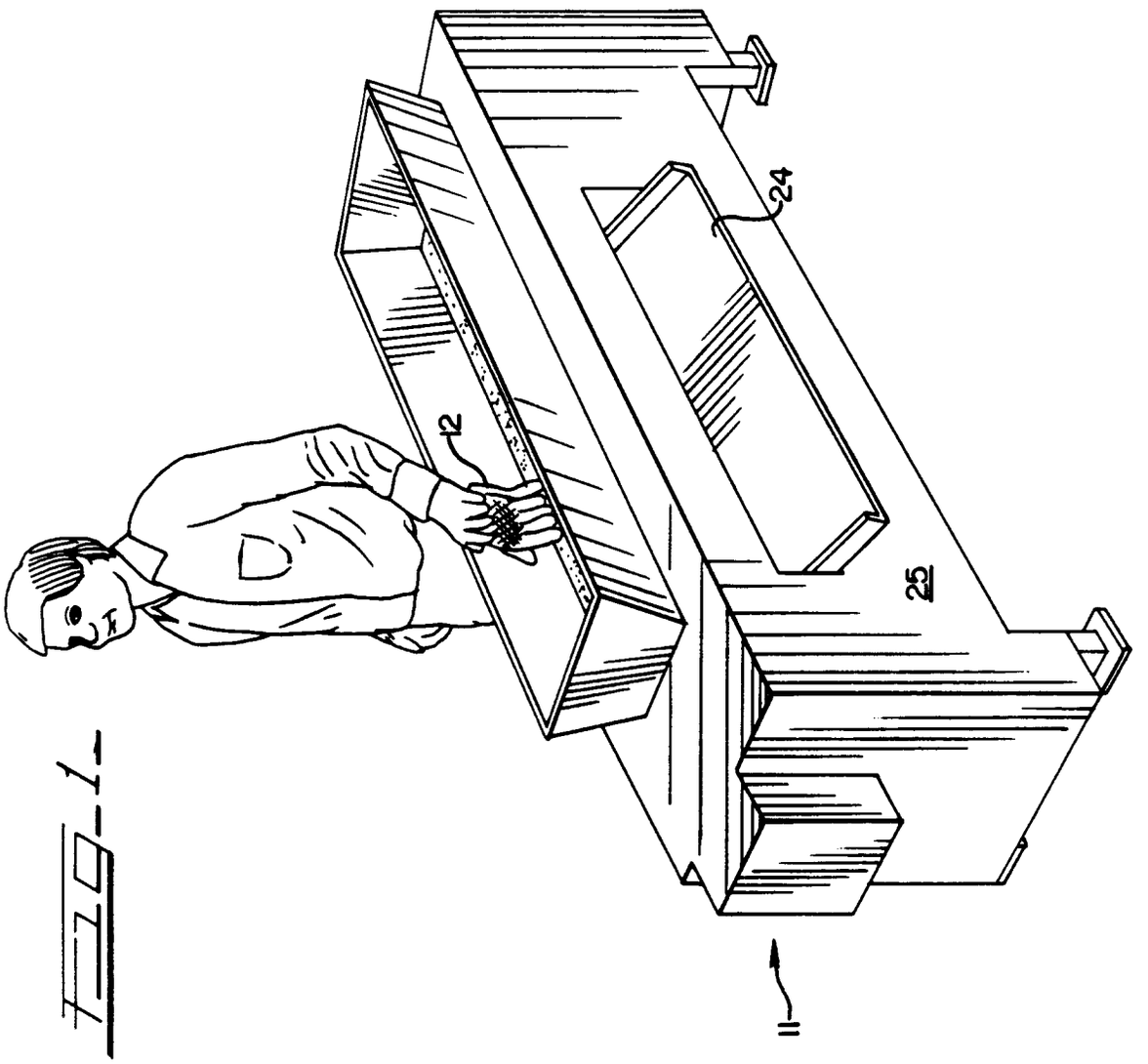


FIG_1



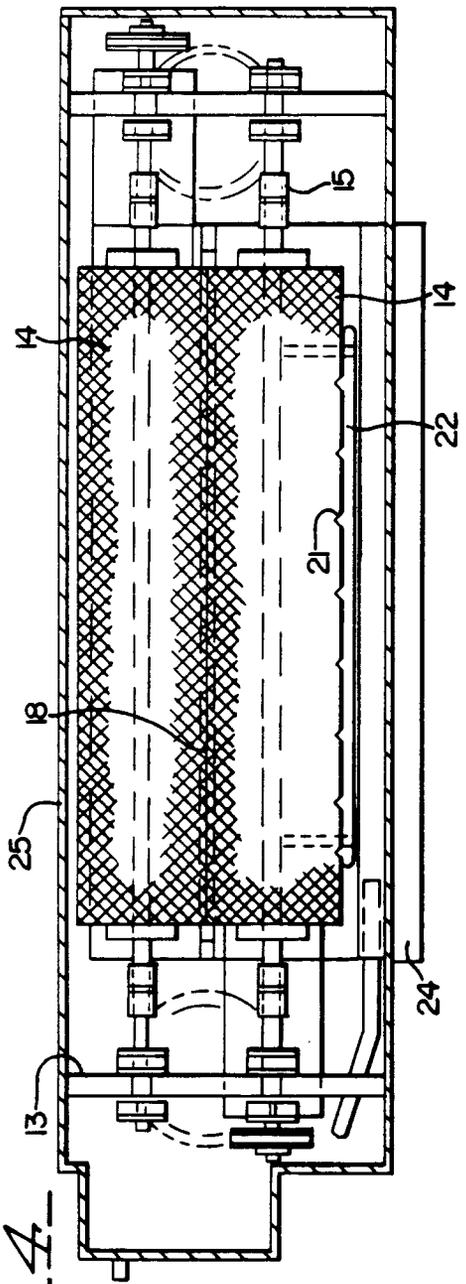


FIG_4

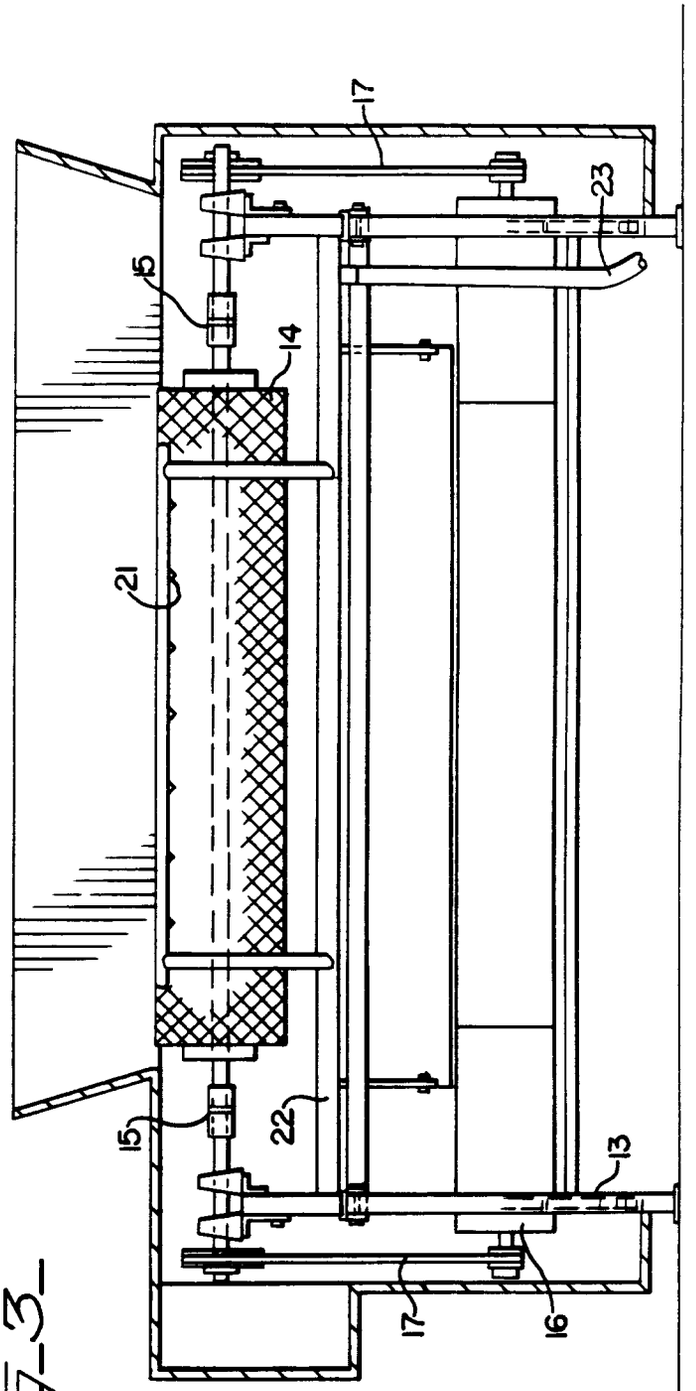


FIG_3

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EUROPEAN SEARCH REPORT

Application Number

EP 91116109.9

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR - A - 2 572 960 (SODILOR) * Fig. 1 * --	1,7,10	B 08 B 1/04
A	FR - A - 2 635 280 (SRTI) * Fig. 9 * --	1,7,10	
A	US - A - 4 285 736 (ARATO) * Fig. 4 * ----	1,7,10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 08 B 1/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	04-12-1991	KNAUER

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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