United States Patent [19]

Wilkerson

[11] **3,853,049**

[45] **Dec. 10, 1974**

[54] **TOMATO SKIN REMOVING DEVICE**

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[73] Assignee: **National Can Corporation,** Chicago, Ill.

[22] Filed: **Jan. 12, 1973**

[21] Appl. No.: **323,068**

[52] **U.S. Cl.** **99/584,** 99/591, 99/593, 99/595, 99/596, 99/630

[51] **Int. Cl.** **A23n 7/00**

[58] **Field of Search** 99/567, 584, 588, 591, 99/593, 595, 596, 630, 642

[56] **References Cited**

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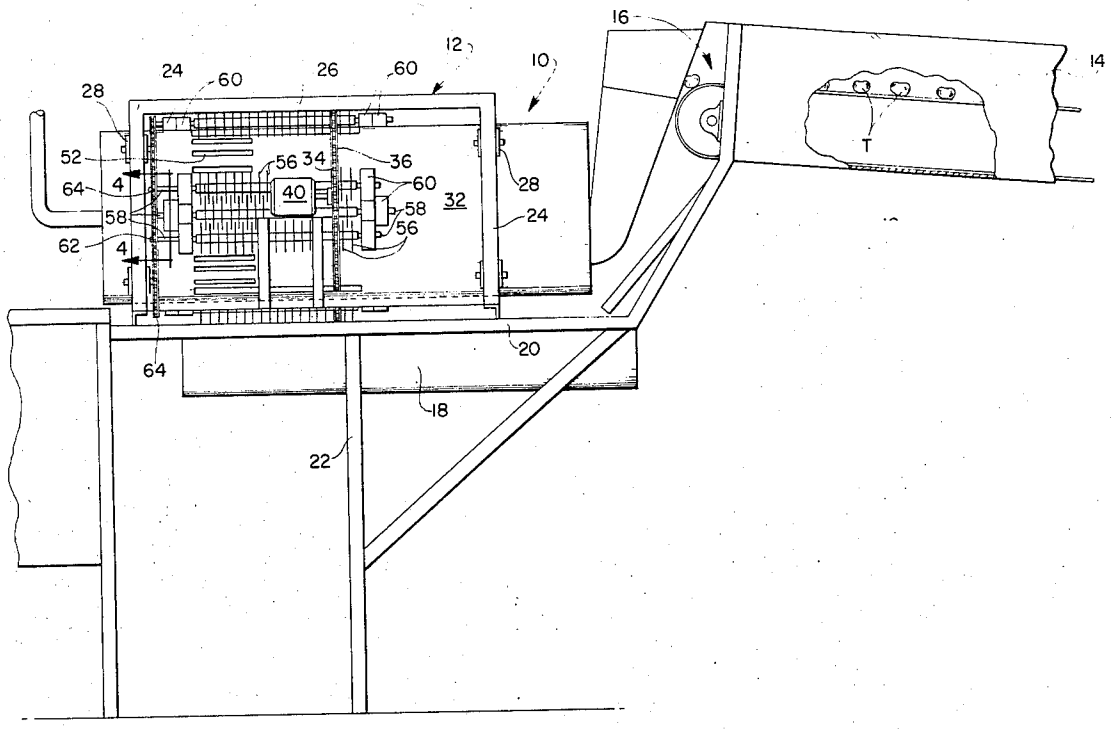
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Primary Examiner—Stanley N. Gilreath

[57] **ABSTRACT**

A device is disclosed to remove skins from tomatoes which skins have been previously loosened from the remaining fruit by known processes such as treatment with a caustic solution. A drum, open at both ends, is rotatably supported within a frame. Tomatoes are fed from one end of the drum to the other and contacted during such transit by a series of rotating discs rotating in a direction opposite to that of the drum. Means including a chain fixed in relationship to the rotation of the drum and sprockets mounted on the drum engagable and in turn rotated by such chain are provided to bring about the relative opposite rotation of the drum and the discs. Also the drum positively moves the tomatoes therethrough by means of a spiral rod attached to the inner surface of the drum. Thus, tomatoes rotating through the drum in a first direction are continuously engaged by the discs which in turn are rotating in a direction opposite to that of the drum and accordingly causing removal of the already loosened skins from the remaining fruit of the tomatoes so treated.

7 Claims, 4 Drawing Figures



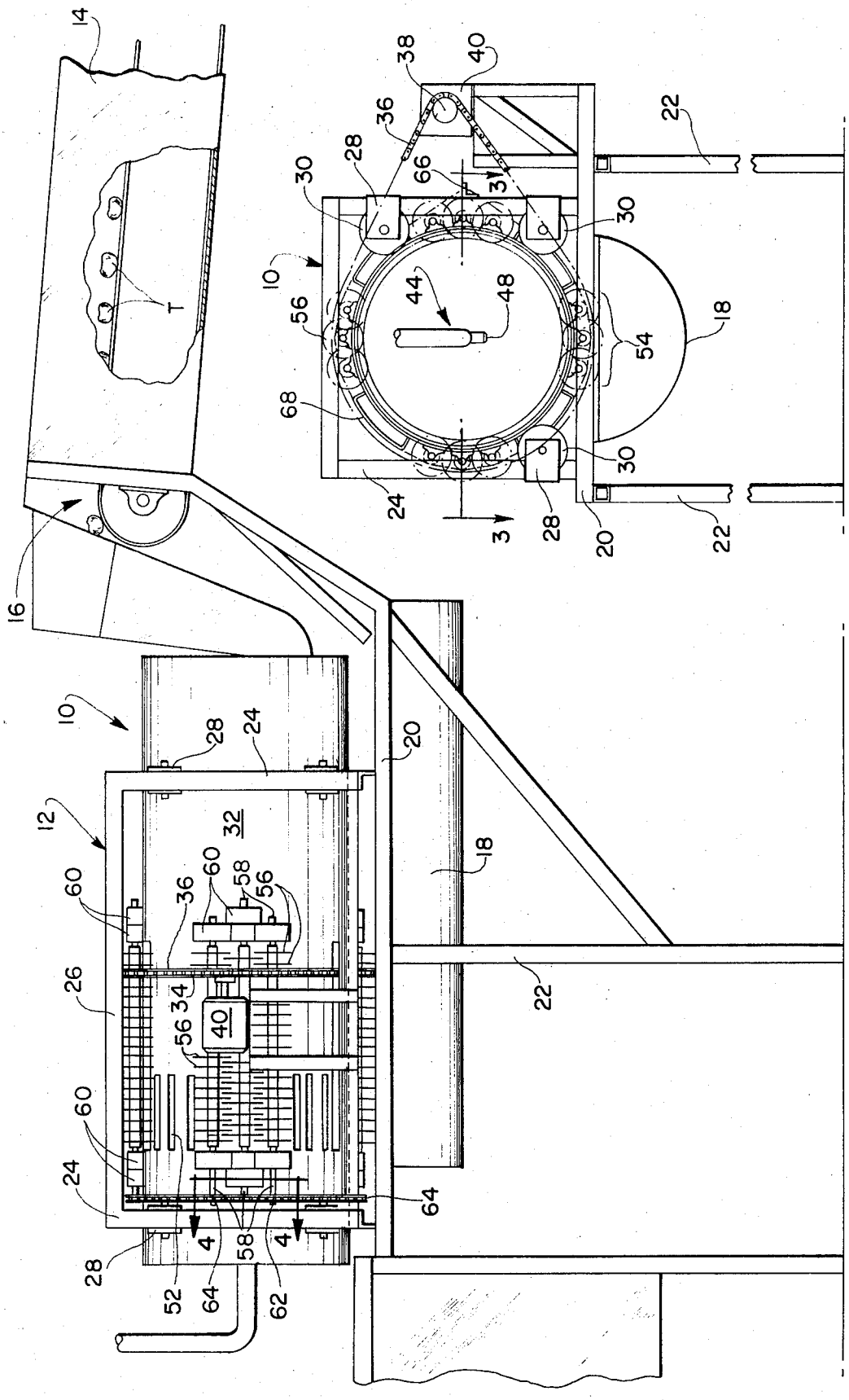

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FIG. 1

FIG. 2

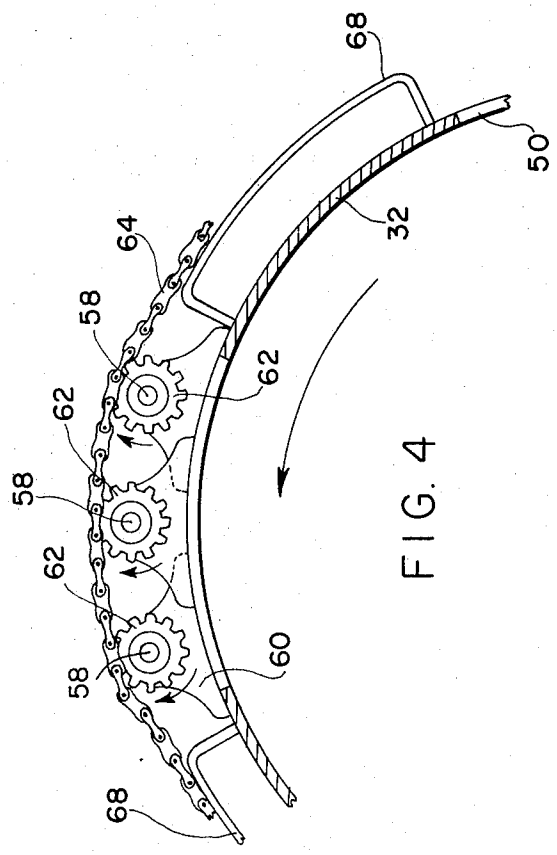


FIG. 4

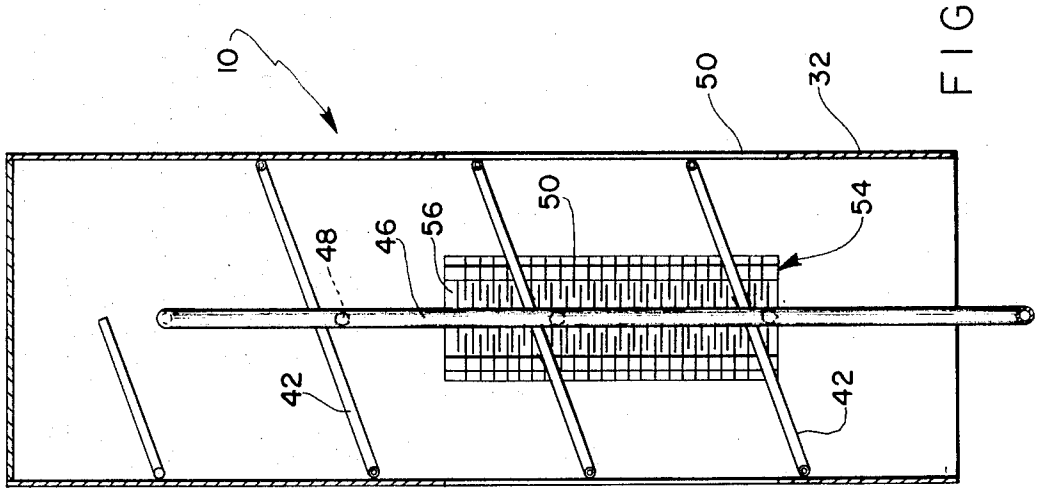


FIG. 3

TOMATO SKIN REMOVING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to a device for removing the peel from tomatoes. Tomatoes suitable for canning are generally sorted and thereafter subjected to a series of washing operations to remove dirt, traces of agricultural chemicals, vines, leaves and the like. Thereafter the skins of such tomatoes are loosened and partially removed by additional treatment in a caustic (sodium hydroxide) bath. It is also customary in the art for the tomatoes to be additionally washed to remove any traces of caustic solution and the thus loosened peelings removed by personnel stationed on sorting lines. It is however increasingly more difficult to obtain personnel required for such operations at a cost consistent with the low margins and the seasonal harvest characteristics of the canning industries.

SUMMARY

It is therefore an object of the present invention to present a device for removing skins or peels from the remaining fruit of tomatoes and the like which is both simple and uncomplicated in structure, easy to operate, and which can be simply and inexpensively maintained.

It is also an object of this invention to provide a device of the nature described which is easy to clean and which will not be unduly damaged in the environment in which it must operate, that of continual contact with water or caustic solutions.

Another object of this invention is the provision of a device which is consistent in its operational characteristics of removing peel from tomato fruit so as to reduce the labor increment of the cost of producing canned tomatoes so that such products may remain low in price and thus enable this highly nutritious and acceptable product to be accessible to all consumers.

These and other important objects will become apparent from the following descriptions and from the accompanying drawings which show preferred embodiments and which form a part of this specification. In the figures, like reference numerals designate like parts with like functions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view with parts broken away for clarity of the device of the present invention showing the overall layout of such device and its relationship with other tomato processing equipment;

FIG. 2 is a side view of the device shown in FIG. 1 of the drawings taken from the left hand side thereon;.

FIG. 3 is a partial sectional view on an enlarged scale taken from the line 3—3 of FIG. 2 of the drawings and depicting in particular the means of positively feeding tomatoes from one end of the device to the other end; and

FIG. 4 is a cross sectional view on an enlarged scale of a part of the circumferential portion of the drum taken along the line 4—4 of FIG. 1 of the drawings and depicts in particular the manner in which the disc shafts are rotated in a direction opposite to that of the rotation of the drum.

DETAILED DESCRIPTION OF THE DRAWINGS

Turning now to the drawings and more particular

FIG. 1 thereof, an overall side view of the device of the present invention is shown. The tomato peeler **10** is mounted within a framework generally designated **12.** The tomato peeler **10** receives tomatoes T from a lye peeler **14** to a suitable delivery system **16.** Tomatoes, the skins of which have been loosened by means of the lye peeler are thus fed to the right hand portion of the tomato peeler **10** as depicted in FIG. **1** of the drawings. The tomatoes are thereafter fed through the tomato peeler **10** and discharged to the left thereof for further processing such as the packaging in cans and subsequent retort processing as is known in the art. Skins loosened by the lye peeler **14** and removed by the tomato peeler **10** of the present invention are collected in trough **18** which is also supported by framework **12.**

Frame **12** includes a platform **20** supported by upright support members **22.** Also supported by the platform **20,** is a pair of spaced inverted U-shaped members **24** formed of suitable material such as channel iron and inter-connected with each other by means of stiffening braces **26.** Supports **28** are in turn fixed as by welding to the U-shaped members at spaced points, three such points being illustrated in the drawing. Each such support or plate **28** is supported by a rubber caster **30** on which a longitudinally orientated drum **32,** open at both ends is in turn supported for rotational movement.

Generally centrally of the drum **32,** a sprocket **34** is mounted. A drive chain **36** is trained over the sprocket **34.** The drive chain **36** is in turn trained over a driving sprocket **38** fixed to the shaft of a motor **40.** In this way then operation of the motor **40** rotates the drum by means of the driving chain **36.** Also is best shown in FIG. **3** of the drawings, feed means **42** which is provided in the drum **32** so as to move tomatoes therethrough as the drum **32** rotates about its fixed central axis. Such feed means **42** may comprise a pipe spacedly attached to the inside of the drum **32** as by welding in a spiral pattern. Washing means **44** comprising a conduit **46** and spaced outlets or spray nozzles **48** is provided to enable washing of the tomatoes in process within the drum **32** so as to not only clean such, but additionally aid in removing the loosened skins from the tomato fruit. Such water spray also aids in diverting removed skins into the trough **18** as will be more clearly hereinafter set out.

The drum **32** is further provided with a series of longitudinally orientated openings **50** and lesser openings **52** both of which are circumferentially spaced about the surface of the drum **32** as best shown in FIGS. **1** and **3** of the drawings. The major openings **50** are adapted to receive sets **54** of peeling discs **56,** which the minor openings or slots **52** assist in directing removed peel for discharge through the drum **32** into the trough **18.**

A plurality of shafts **58,** each spaced from each other are mounted for rotational movement parallel to the major longitudinal axis of each respective set of openings **50.** Each end of each shaft **58** is rotatally supported in a journal block **60** which in turn is attached to the outside surface of the drum **32.** Each shaft **58** supports a plurality of equally spaced discs **56** adapted to rotate upon rotation of the shafts **58.** One such shaft **58** is longitudinally displaced in relationship to the others in each set **54** as is best shown in FIGS. **1** and **3** of the drawings. Such mounting enables respective discs **56** of opposed rows of such discs to interdigitate with

each other. Furthermore the sizing of the diameter of the discs **56** and the mounting of the shafts **58** in relationship to the openings **50** of the drum **32** is such that the discs **56** protrude a minor distance into the interior of the drum generally equal to or slightly less than the spacing of the feed means **42** from the interior surface of the drum **32.**

Furthermore each shaft **58** is provided at one end thereof with a sprocket **62.** The sprockets **62** are preferably disposed in a single plane generally normal to the fixed axis of the drum **32** such that a single chain **64** may be trained thereover, thus causing rotation of the shafts **58** and in turn the discs **56** supported thereon. Chain **64** is stationary in that it is fixed at a point **66** on the frame **12** as by welding so as to prevent its rotation along with the rotation of the drum **32.** Chain **64** is further supported in spaced relationship from the drum **32** by means of a plurality of chain lifters **68** spanning the major extent of the outer circumferance of the drum between the openings **50** thereof in the plane depicted by FIG. **4** of the drawings. It will thus be apparent that rotation of the drum in a counterclockwise direction as indicated in FIG. **4** of the drawings will cause a relative counterclockwise movement of each sprocket **62** which in turn will cause opposite rotational movement to that of the flow of the tomatoes T through the drum **32.** Such relative movement is believed to in part enable the device of the present invention to acomplish satisfactory removal of loosened tomato skins.

SPECIFIC EMBODIMENT OF THE INVENTION

The device of the present invention as above described is constructed utilizing a round rotatable drum 24 inches in diameter and 5 feet long. Inside the drum, a ¾ inch spiral pipe was welded to the drum with a ½ inch space between the pipe and the drum. The drum was driven by a 180 rmp motor with a 90 tooth RC80 sprocket welded on the outside of the drum and a 12 tooth RC80 sprocket on the motor. The speed of the drum thus varied between 22 and 24 rpm.

The rotatable drum was mounted on 6 inch rubber wheels. Each disc shaft was 1 inch in diameter and formed of cold rolled stock to which 4 inch rubber discs were press fitted for permanent attachment. The shaft sprockets were 12 tooth RC40 and each rubber disc protruded inside the drum about ¾ inch.

Operation of the device completely removed the peels from essentially all tomatoes processed thereby.

It is thus apparent that a simple low cost process peeling device which is easy and inexpensive to maintain and which accomplishes the other objects of the invention has been disclosed hereinabove.

While in the foregoing specification, this invention has been described in relation to a certain preferred embodiment thereof, it will be apparent to those skilled in the art that the invention may take the form of additional embodiments without departing from the scope of the invention as hereinafter claimed.

I claim:

1. A device for removing the skins of tomatoes and the like comprising:

a drum open at both ends and mounted for rotation about its fixed longitudinal axis in a first direction;

a plurality of discs mounted on at least one shaft for rotation about the longitudinal axis of said shaft in a second direction opposite to said first direction, all of said axes being generally parallel to each other, said discs longitudinally spaced from each other along said shaft and each extending an equal minor distance into the interior of said drum from the circumference thereof;

means for rotating said drum in said first direction and;

separate meanas for rotating said discs in said second direction including a stationary chain supported by said drum, a sprocket mounted on each said disc shaft, said sprockets in turn mounted on said drum and each of said sprockets in turn engaged with said chain whereby rotation of said drum in said first direction causes rotation of said sprockets and said discs in said second direction.

2. A device for removing the skins of tomatoes and the like comprising:

a frame;

a rotatable drum mounted on said frame and having an entrance end and a discharge end, said drum having means for positively feeding tomatoes from said entrance end through said drum to said discharge end, means for rotating said drum about its fixed longitudional axis of a first direction, said drum having a plurality of longitudinally orientated circumferentially spaced opening therethrough;

a set of rotatable discs mounted on parallel shafts in turn mounted on said drum at each of said openings through said drum, each set comprising at least two rows of a plurality of longitudinally spaced rotatable discs, said discs each extending an equal minor distance into the interior of said drum;

and separate means for rotating said discs about the longitudinal axis of their respective shafts in a second and opposite direction to said drum.

3. The device of claim **2** wherein each shaft is rotatably supported by said drum, said discs of each shaft are generally equally spaced from each other, the discs of one shaft longitudinally staggered in relationship to the discs of another shaft opposed to said one shaft and wherein said discs of said one shat interdigitate with the discs of said other shaft.

4. The device of claim **3** wherein said means for rotating said discs further provides that each shaft is provided with a sprocket and a stationary chain supported by said drum simultaneously engages said sprockets.

5. The device of claim **4** wherein said chain is attached to said frame and in part supported and spaced from the surface of said drum by a plurality of chain lifters, each of said lifters spanning the distance between the shaft sprockets of each respective set of discs, each of said sprockets and lifters positioned in a single plane said plane normal to the axis of said drum.

6. The device of claim **2** wherein the means for feeding said tomatoes comprises a spiral member attached to the interior surface of said drum, said member extending radially inwardly from the interior surface of said drum a minor distance generally equal to the extent of said discs.

7. The device of claim **2** wherein the means for rotating said drum comprises a sprocket circumferentially attached to said drum, a motor and a chain trained about said sprocket and operatively connected to said motor.

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