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APPARATUS FOR HANDLING MEAT PRODUCTS

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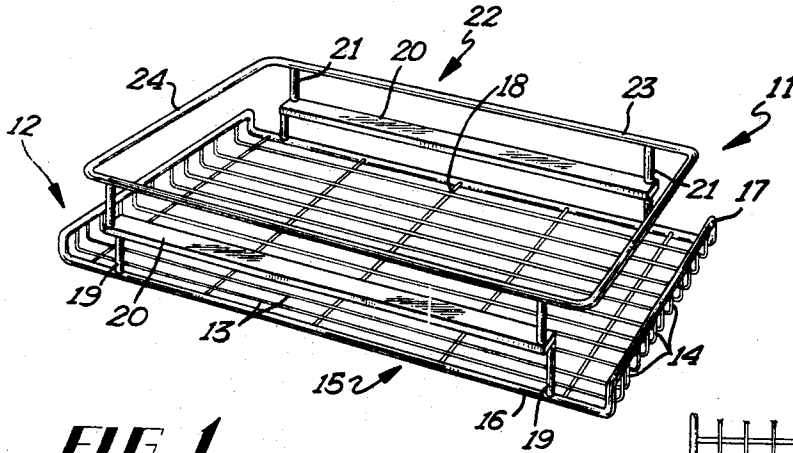


FIG 1

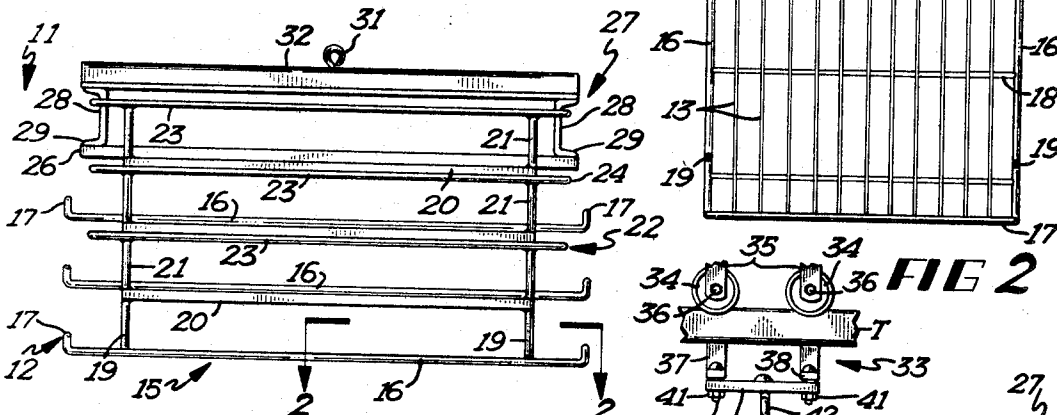


FIG 2

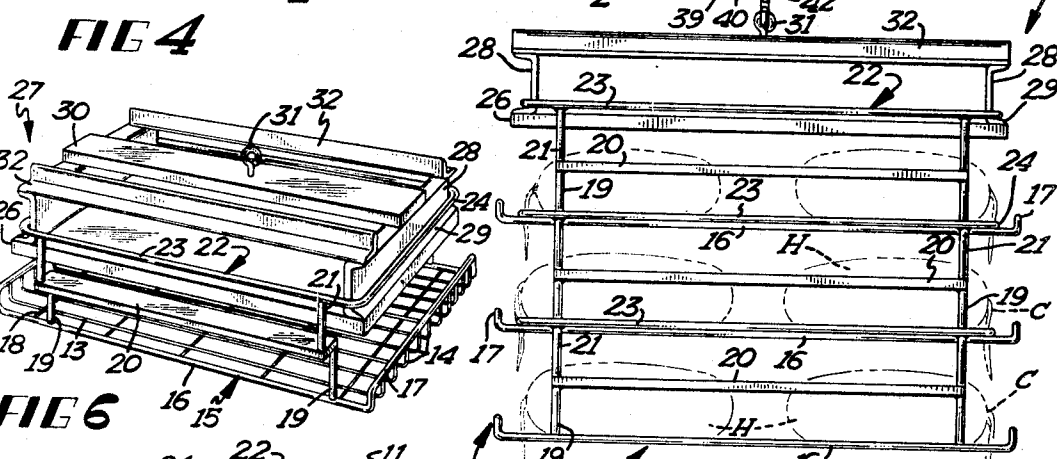


FIG 3

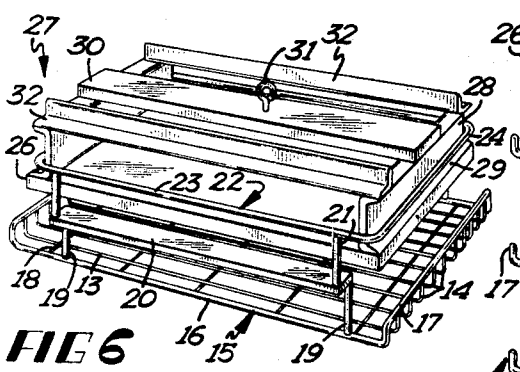


FIG 4

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APPARATUS FOR HANDLING MEAT PRODUCTS
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ABSTRACT OF THE DISCLOSURE

This invention relates to article handling apparatus for use in handling cuts of meat, such as hams, during curing and smoking of these cuts of meat.

In processing hams, as well as other cuts of meat, after the ham has been treated at the pumping station, it is then placed in a holding chamber and is held for a predetermined period of time during which curing of the ham occurs. Thereafter, the ham is transferred to a smoking chamber where it is smoked to give its characteristic smoked flavor.

It is also desirable to subject certain cuts of meat, such as hams, to a pressing action during curing thereof to cause the hams to have the natural loaf shape. This is especially true of those hams from which the bone has been removed. Pressing of deboned hams causes those surface areas which define the void resulting from the removal of the bone to intimately contact each other so that these surfaces will adhere together during curing. It is also desirable to minimize manual handling of the hams or other cuts of meat during the various treatment processes, since not only does handling increase the likelihood of contamination of the product but also involves time consuming operations. Heretofore, it has been the practice to place a plurality of hams in some sort of supporting structures while the hams are being cured and thereafter manually transferring the cured hams to other apparatus for transferring the cured hams to the smokehouse.

It is therefore a general object of the present invention to provide novel article handling apparatus including a plurality of interrelated tray units for simultaneously supporting a plurality of cuts of meat, such as ham, during cooking and smoking of the ham to thereby eliminate manual handling of the hams after the hams have passed through the pumping and stocknetting station.

Another object of this invention is to provide a novel and improved apparatus for supporting a plurality of cuts of meat, such as hams and the like, during curing and smoking thereof, in which the apparatus also serves to very effectively compress the hams during curing thereof so that the interfacial surfaces will adhere together, said apparatus being arranged and constructed so that the hams will have little if any scoring on the surface thereof as a result of the pressing operation.

A more specific object of this invention is to provide a novel article handling apparatus for handling hams during the cooking and smoking treatment thereof, which apparatus is comprised of a plurality of similar perforate tray units arranged one above the other, and each serving to support a plurality of hams thereon, said tray unit cooperating with each other when positioned upon a support to compress the hams and to impart a natural loaf shape thereto, the tray units also serving to support the hams in properly spaced apart relation when the tray units are suspended from an overhead track mounted trolley, so that the hams may be effectively smoked when placed in a smokehouse.

These and other objects and advantages of this inven-

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tion will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a perspective view of one of the tray units which constitutes an essential part of the novel apparatus;

FIG. 2 is a fragmentary top plan view of a portion of the tray unit illustrated in FIG. 1 illustrating details of construction thereof;

FIG. 3 is an end elevational view of one of the tray units;

FIG. 4 is a side elevational view of the apparatus in a collapsed compressing condition;

FIG. 5 is a side elevational view similar to FIG. 3 but illustrating the apparatus in a suspended expanded condition; and

FIG. 6 is a perspective view of the mounting frame and the uppermost tray unit.

Referring now to the drawings, it will be seen that one embodiment of the article handling apparatus, designated in its entirety by the reference numeral 10, is there shown. This article handling apparatus 10 is comprised of a plurality of similar article handling units 11, each of which is adapted to support thereon a plurality of cuts of meat such as hams or the like.

To this end, it is pointed out that the article handling apparatus 10 has been found to be especially adapted for use in handling hams during curing and smoking thereof. During the processing of hams, it is desirable to compress the hams during the curing step to impart a natural loaf shape to the hams and to eliminate any voids or spaces that might occur within the hams. Hams which have had the bone removed therefrom will have a void therein which results from the removal of the bone. Pressing of such deboned hams during curing causes the interfacial surfaces that define the void to intimately contact each other and adhere together.

In the present apparatus, each of the article handling units 11 is of identical construction and each unit is comprised of a tray structure 11. It will be noted that the tray structures 11 are of perforate construction, each comprising a plurality of elongate metallic rods 13, each of which has its opposed ends bent upwardly as at 14. It will be noted that the rods 13 are disposed in spaced apart parallel relation with respect to each other and are secured to a generally rectangular shaped peripheral frame 15.

The peripheral frame 15 includes longitudinal side frame elements 16 which have their ends bent upwardly in the manner of the rods 13 and these longitudinal frame elements 16 are integrally connected to transverse frame elements 17. The upturned ends 14 of the rods 13 are rigidly affixed to the transverse frame elements 17 as by welding so that the tray structure, while being of generally rectangular flat configuration also has upturned ends. It will be noted that the frame elements that form the peripheral frame 15 are of substantially heavier stock than the rods 13.

Each tray structure 12 also includes a plurality of transverse rods 18 which are disposed in spaced apart substantially parallel relation with respect to each other, and each having its ends secured as by welding to the side frame elements 16. The rods 18 are also welded or otherwise secured to the lower surfaces of the longitudinal rods 13. It is preferred that all of the elements of the tray structure be formed of chrome plated steel or stainless steel.

A plurality of vertically extending connecting and spacing elements 19 are rigidly secured to the longitudinal frame elements of each tray structure 12 and project upwardly therefrom. The upper end of each of these con-

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necting and spacing elements 19 is rigidly secured to generally flat elongate rectangular stop members 20.

A pair of such stop members 19 are provided, as best seen in FIG. 3, and these stop members project outwardly beyond the sides of the tray structure 12. Stop members 20 are disposed in substantially parallel relationship and each has a pair of vertical connecting and spacer elements 21 secured thereto and projecting upwardly therefrom. It will be noted that each pair of spacer elements 21 have their respective lower ends secured to the associated stop member 20 adjacent the outer longitudinal edge of the latter and are therefore offset laterally with respect to the spacer elements 19, as best seen in FIG. 3.

A suspension frame 22 of generally rectangular configuration is secured to the upper ends of the connecting and spacing elements 21 and this suspension frame 22 is comprised of longitudinal frame elements 23 which are integrally formed with transverse frame elements 24. It will be noted that the longitudinal frame elements 23 are substantially shorter than the longitudinal frame elements 16 of the peripheral frame 15. However, the transverse frame elements 24 of the suspension frame 22 are substantially longer than the transverse frame elements 17 of the peripheral frame 15. With this arrangement, the tray structure of one unit may be positioned below the suspension frame 22 of the next lower unit so that when the entire apparatus is suspended, each suspension frame will engage the upper surface of the tray structure of the next adjacent upper unit. When the apparatus is allowed to collapse, as in FIG. 4, the lower surface of the tray structures will engage the upper surface of the stop members 20 so that the spacing between adjacent tray structures is diminished. The lower surface of the stop members 20 will engage the upper surface of the next lower suspension frame 22, when the apparatus is in the collapsed condition.

Referring now to FIGS. 4, 5 and 6, it will be seen that the uppermost article handling unit 11 is releasably connected to a mounting frame 27, which is of generally rectangular configuration. This mounting frame 27 is of heavy construction and includes a substantially flat lower plate 26 to which is secured a pair of spaced apart substantially parallel channel-shaped end members 28. Each channel-shaped end member 28 includes a web which has outturned flanges 29 secured thereto. It will be noted that the spacing between the exterior surfaces of the webs 28 of the channel members is less than a length of the longitudinal frame elements 23 of the suspension frame 22.

With this arrangement, it will be noted that the suspension frame 22 of the uppermost article handling unit 11 may be positioned in embracing relation with respect to the mounting frame 27 so that the transverse frame elements are positioned between the flanges 29 of the associated channel-shaped end member 28. When the mounting frame 25 is suspended by a trolley, the suspension frame of the uppermost article handling unit will engage the lowermost flanges 29 of the mounting frame and when the apparatus is in a collapsed condition as illustrated in FIG. 4, the suspension frame will be positioned adjacent the uppermost flanges 29.

It will be noted that the mounting frame 29 includes a generally rectangular flat attachment plate 30 which extends between and is rigidly secured to the channel-shaped end members 28. This attachment plate 30 has a centrally located eye bolt secured thereto and projecting upwardly therefrom. A pair of longitudinally extending side stiffening elements 32 extend between and are rigidly secured to the end members 28 as best seen in FIG. 6.

A carriage or trolley 33 is provided for suspending the article handling units 11 from an overhead track T which permits the article handling units to be transferred from a storage area to a smokehouse. The trolley 33 includes a pair of track engaging flanged wheels 34 which are secured to a frame 35 by suitable axles 36, as best seen

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in FIG. 5. It will be noted that the frame 35 has a pair of depending straps 37 secured thereto which have transverse arms 38 rigidly secured to the lower ends thereof and projecting horizontally therefrom. The straps 37 are disposed in substantially parallel spaced apart relation and the transverse arms thereof are suitably apertured to permit bolts 39 to project therethrough. An elongate mounting bar 40 has opposite ends thereof apertured to permit the passage of bolts 39 therethrough and retaining nuts 41 readily engage the lower ends of the bolts 39 to clamp the mounting bar 40 against the transverse arm 38. A mounting hook 42 is secured to the mounting bar 40 and the hook 42 is adapted to engage the eye bolt 31 of the mounting frame 25 to suspend a plurality of the article handling units 11 from the overhead track T. Thus, the article handling apparatus 10 may accommodate a plurality of hams thereon for handling and supporting the hams during the curing (pressing) and smoking operation.

To this end, each article handling unit 11 is adapted to accommodate a plurality of hams thereon and in the embodiments shown six such hams are loaded in each article handling unit 11. The hams are positioned upon the tray structure 12 of the lowermost article handling unit after the hams have passed through the ham pumping and stockinnetting stations. It will be seen that each ham H is positioned within a fabric cover or container which is generally referred to the trade as stockinnetting.

The entire article handling apparatus 10 will have first been cleaned at a suitable washing and cleaning area and the article handling units will be suspended from the track T when they are moved into position for loading. The article handling units 11 will be loaded while in suspended relation and will then be positioned upon a suitable support, such as a pallet. In the embodiments shown, the hams will be positioned upon each tray structure 12 so that the ends of each ham will be spaced longitudinally from the centermost transverse rod 18 and will be spaced from the adjacent endmost rod 18. After the units have been loaded and positioned upon a pallet, then the tray structure 12 of each unit will engage the stop members 20 of the next lower unit. The hams which have been positioned within each unit, will be engaged by the transverse rods 18 of the next adjacent article handling unit and will compress the hams downwardly. However, because of the spacing of the hams in the lowermost unit, the upper surface of each ham will be engaged by only one of the transverse rods 18. In each tray structure 12, those transverse rods 18 located between the centermost transverse rod and each end transverse rod 18 will engage the hams positioned in the tray therebelow. Thus, during the pressing and curing operation, only one transverse groove will be made upon the upper surface of each ham and this groove will readily disappear during smoking, so that the upper surface of the hams are not scored in the conventional way.

The lower plate 26 of the mounting frame will engage the stop members 20 of the uppermost article handling unit and will exert a downward pressing action upon the hams located and supported in the uppermost article handling unit. Because of the relatively heavy weight of the mounting frame 27, the mounting frame serves to apply sufficient weight to the hams in the uppermost article handling units to produce the desired pressing action. Since each article handling unit is positively stopped by the interengagement of the tray structure with the stop members on the article handling unit located therebelow, the hams will be uniformly pressed.

The hams are retained in pressed relation during curing for a period of approximately seven days. During this pressing action, the hams, will, of course, be cured to impart the desired flavor which is produced by bacterial action on the hams. It is necessary during this curing step that the pressing medium be of perforate construc-

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tion to permit air to circulate over the surfaces of the hams to permit the desired bacterial action to take place. Thus, the perforate construction of the article handling units 11 permit effective circulation of air over the surface of each ham.

The pressing action which occurs simultaneously during curing of these hams gives hams its natural loaf shape and also serves to close any cavities in the ham which would result from the removal of bone therefrom. The pressing action causes internal surfaces of the meat to adhere together so that these surfaces bond to each other during curing. By engaging the upper surface of each ham with only one transverse bar, the upper surface of the ham will not be scored by the pressing operation. The shallow groove produced by the single transverse rod 18 upon the upper surface of each ham will disappear during the smoking operation so that no permanent scoring is produced during the pressing operation.

After a plurality of hams have been pressed and cured, the stack interlocked handling units 11 will be lifted so that the eye bolt 31 on the mounting frame 27 may be engaged by the mounting hook of the carriage or trolley 33. The entire apparatus may be lifted as a unit by any suitable lifting means, such as a fork lift truck. After the article handling units 11 have been suspended from the trolley or carriage 33, the units will be disposed in expanded relation as best seen in FIG. 5. The suspension frame of the uppermost article handling unit will be suspended from the mounting frame 27 while the remaining suspension frames of each article handling unit will engage and be suspended from the tray structures 12 of the article handling unit located thereabove. Thus, the tray structures are spaced apart a sufficient distance so that smoke may effectively circulate between adjacent of the article handling units.

The entire apparatus with the hams thereon will be allowed to remain in the smokehouse area or smoking zone for a period of approximately sixteen hours after which the apparatus is removed and the hams are chilled while remaining on the apparatus for a period of approximately three days. This completes the treatment cycle. The hams may be readily unloaded from the apparatus when it is in suspended relation from an overhead track so that the apparatus may be returned to the washing and cleaning area wherein the units may be readily cleaned in the suspended expanded condition.

It will be noted that by using the article handling apparatus 10 in the pressing and smoking of a plurality of cuts of meat, such as ham and the like, the cuts of meat may be loaded upon the apparatus after passing through the pumping and stockineting station and will not require additional manual handling until the smoking chilling steps are completed. Further, the novel apparatus not only minimizes the handling of hams, but provides a highly effective supporting and pressing medium during curing of the hams. The open framework construction of the article handling units not only permits the desired circulation of air during curing while the hams are arranged in superimposed stacked relation, but also permits effective circulation and penetration of smoke with respect to the surfaces of the ham during smoking operation. Further, the unique construction of the article handling apparatus avoids scoring of the upper surface of the hams.

Thus, it will be seen that I have provided a novel ap-

paratus which is not only of simple and inexpensive construction but one which functions in a more efficient manner than any heretofore known comparable apparatus.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of our invention.

What is claimed is:

1. A collapsible and expandable meat handling apparatus for use in pressing a plurality of chunks of meat and for supporting the chunks of meat for movement through a smoking chamber, said apparatus comprising:

a mounting frame,

a trolley releasably engaging said mounting frame adapted to be mounted on an overhead track,

a plurality of similar article handling units arranged one above the other, the uppermost unit being secured to said mounting frame for relative vertical movement therebetween,

each unit including a perforate generally flat, horizontally oriented tray structure, and an annular frame, means rigidly securing each tray structure and its associated frame together so that the latter is positioned above its associated tray structure, the frame of one unit being engaged by the upper surface of the next upper tray structure when said trolley suspends said units from an overhead track so that chunks of meat on adjacent trays will be spaced vertically from each other,

each unit having stop means thereon positioned above the associated tray structure and positioned below the associated frame, said stop means on one unit being engaged by the next adjacent tray structure thereabove whereby the spacing between the tray structure will be diminished and the lower surface of each tray will engage and press downwardly on the chunks of meat on the next lower tray structure.

2. The apparatus as defined in claim 1 wherein the longitudinal dimension of each tray structure of each unit is greater than the longitudinal dimension of the associated annular frame.

3. The apparatus as defined in claim 2 wherein the width dimension of each annular frame of each unit is greater than the width dimension of the associated tray structure.

4. The apparatus as defined in claim 1 wherein said stop means includes a pair of spaced-apart elongate stop bars each extending longitudinally of one longitudinal edge of the associated tray structure.

5. The apparatus as defined in claim 1 wherein each tray structure has upwardly extending longitudinal end portions.

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