

[54] **FOOD PRESS AND DIES**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 878,439, Nov. 20, 1969, and a continuation-in-part of Ser. No. 67,482, Aug. 27, 1970.

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[51] Int. Cl. **B30b 7/04**

[58] Field of Search ..18/47 R; 31/44; 17/38; 99/349; 100/232, 295, 42, 218, 269 R, DIG. 10, 272, 286, 214, 249

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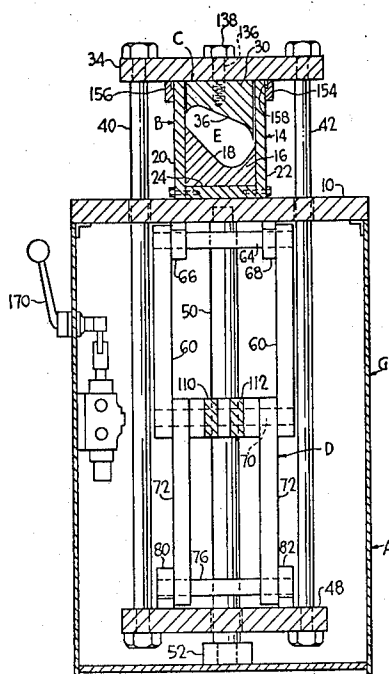
Primary Examiner—Billy J. Wilhite

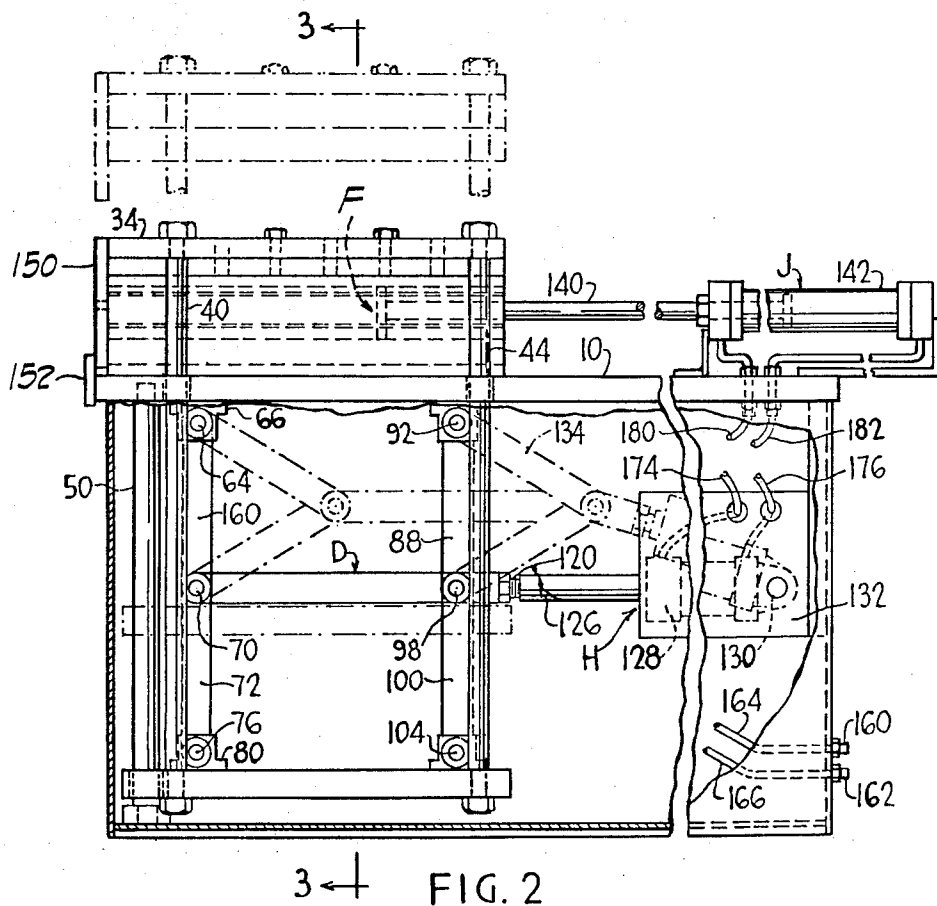
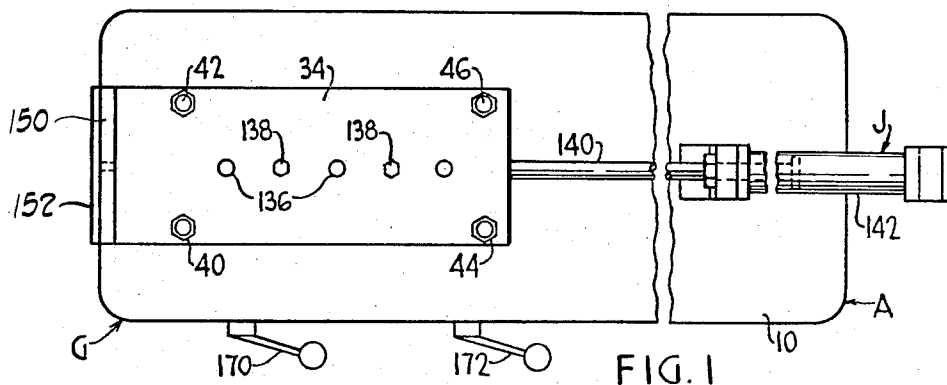
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[57] **ABSTRACT**

A press for shaping comestible products, such as meat and the like, in a tubular die aperture or cavity of uniform cross section by a ram, preferably made of a nontoxic or edible plastic, for example, Nylon, reciprocable in the die aperture by a cylinder and piston-type fluid actuator constructed so that no portion of the piston rod that might extend into the die aperture is retracted into the cylinder of the fluid actuator. The die aperture is formed by a channel-shaped stationary die means and a channel-shaped movable die means at least partially receivable, when the die means are closed, in the stationary die means, each die means being preferably shaped or oriented to maximize opposed forming or pressing areas. The movable die means is moved by a toggle link mechanism actuated by a cylinder and piston-type fluid actuator. Travel or movement of the movable die means into the stationary die means is limited to prevent engagement of the die means at the periphery of the die cavities therein. Clearance is provided between the die means for the escape of air entrapped in the die aperture when a product is compressed therein.

10 Claims, 7 Drawing Figures





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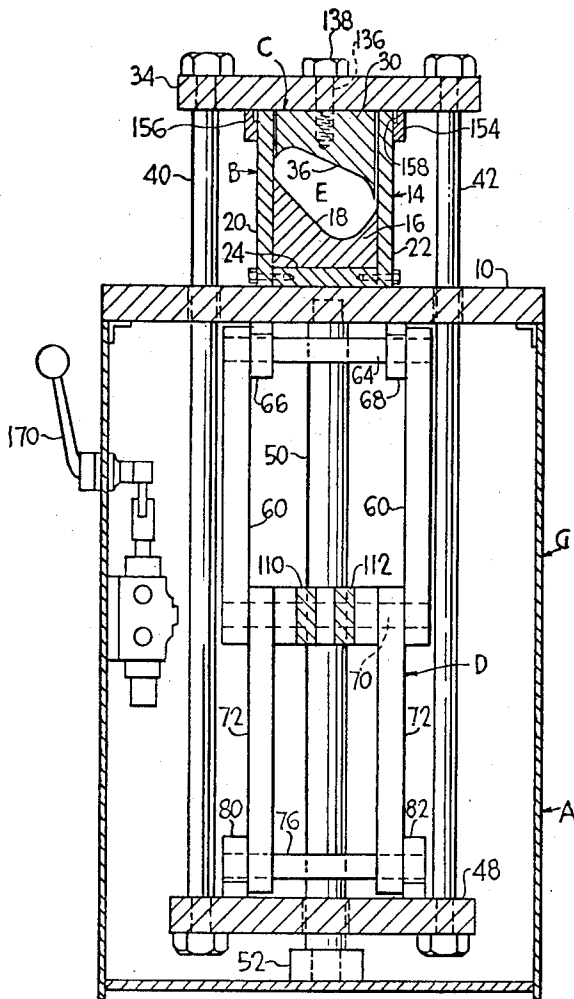


FIG. 3

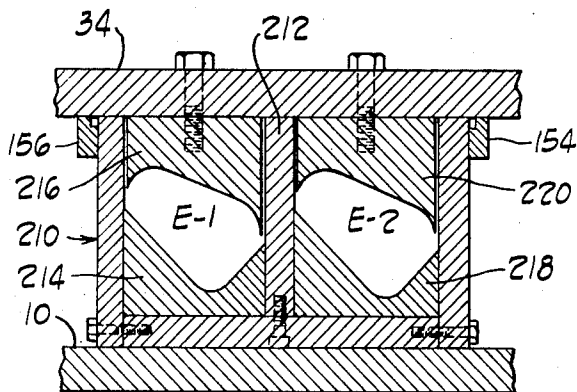


FIG. 5

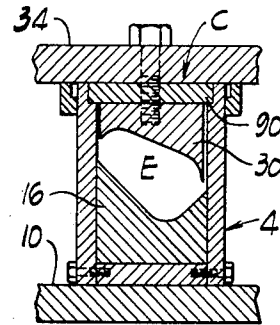


FIG. 4

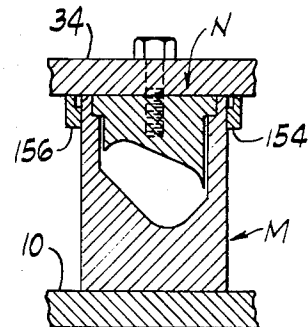


FIG. 6

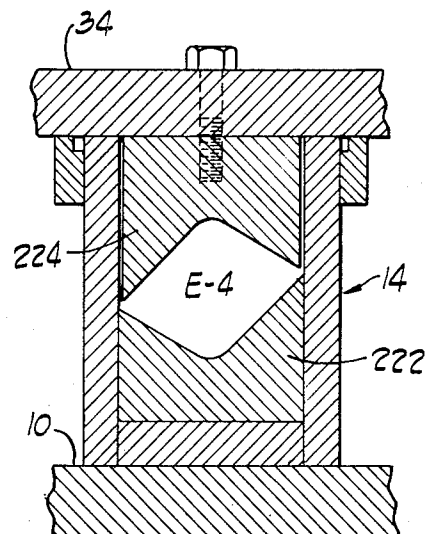


FIG. 7

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RELATES CASES

This application is a continuation-in-part of my copending applications, Ser. No. 878,439, filed Nov. 20, 1969, and Ser. No. 67,482, filed Aug. 27, 1970, the disclosures of which are incorporated herein by reference.

FIELD OF INVENTION

This invention relates to apparatus for compressing and shaping comestible products.

PRIOR ART

Food products, especially meat products, such as ground meat, steaks, knuckles and the like, are often pressed into blocks or loaves of desired density and shape, typically while frozen or semi-frozen, for subsequent processing, such as, slicing into pieces of generally uniform size, shape and weight. Presses for this purpose have utilized relatively movable opposed die members which when closed form a tubular aperture within which the product is compressed by a reciprocable ram. In such prior art devices, however, the peripheral sides of the die cavities terminated in lands lying in the same plane at right angles to the path of relative movement between the dies with the result that the opening of the die cavities were relatively narrow making the press hard to load in many instances and occurrence of product between the lands interfered with the proper closing of the press. Because of the aforementioned and other reasons the prior art presses have not been entirely satisfactory.

SUMMARY OF INVENTION

The present invention provides a novel and improved food press and die means, particularly adapted for the pressing of comestible products, especially meat and fish, into predetermined form, by a ram reciprocable in the aperture or cavity formed when the dies are closed.

One of the die means is channel-shaped with parallel sides and a die cavity of uniform cross-sectional shape at the bottom of the channel and the other is at least partially receivable in the channel of the first mentioned die means with a die cavity also of uniform cross-sectional shape in the portion received in the channel of the first mentioned die means. The longitudinal peripheral edges of the die cavities are offset from one another in the direction of the relative movement between the dies so as to provide wider openings to the cavities than would otherwise be the case to facilitate loading of the press and the die cavities are preferably irregular in transverse cross-sectional shape so that during closing, the dies apply a greater than normal force to a product being compressed in the direction transversely of the direction of relative movement between the die. The die members also are preferably so constructed that there are no abutting planar areas at the periphery of the die cavities and that there is clearance for the escape of air entrapped in the die aperture during pressing of a product therein by movement of the ram. The invention will be better understood and further advantages, as well as objects, thereof will become apparent from the accompanying drawings and the ensuing description of the preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a good press embodying the present invention;

FIG. 2 is a side elevation with portions broken away of the press shown in FIG. 3;

FIG. 3 is a sectional view approximately on the line 3—3 of FIG. 2; and

FIGS. 4 to 7 are transverse sectional views similar to a part of FIG. 3 illustrating modified die assemblies.

DESCRIPTION OF PREFERRED EMBODIMENT

The preferred apparatus embodying the invention is a food press, designated generally as A, comprising two die means or die assemblies, B, C, at least one of which is movable toward and from the other by means including toggle linkage mechanism D which assures predetermined travel of the die means or members toward and from one another. When the dies are closed they form a tubular die aperture or cavity E of uniform cross section within which the product being processed is compressed by a reciprocating ram F. All of the operating mechanism of the press is carried by a plate 10 detachably connected to and closing a frame or base which is in the form of a cabinet G enclosing the operating mechanism of the press. The plate 10 and the operating mechanism can be readily removed as a unit from the cabinet to facilitate maintenance, etc. of the press.

The die means or assembly B is stationary and comprises a channel-shaped die box 14 having a removable die insert 16 detachably connected thereto and provided with a die cavity 18 of uniform cross-sectional shape extending from end to end. The cavity 18 is in the bottom of the channel-shaped die assembly and in the side of the die insert farthest from the plate 10 and preferably extends essentially the full width of the insert with its peripheral side edges reaching to or essentially to or terminating at the lateral sides of the die insert and the planar sides of the die box facing one another. The die box 14 is detachably secured to the outer side of the plate 10 of the press proper and comprises two side plates 20, 22 fixed to a bottom plate 24, but may be made in one piece, if desired. The die insert 16 is removably secured in the die box in a suitable manner as by bolts, screws and/or dowel pins.

The die means or assembly C is movable and comprises a die or die insert 30 detachably connected to the side of a movable plate or platen 34 facing the outer side of the plate 10. The member 30 has a die cavity 36 in its side opposite the side connected in the platen 34. The cavity 36 is of uniform cross-section shape from end to end of the insert and its peripheral side edges preferably extend essentially to or terminating at the lateral sides of the member 30.

The platen 34 is connected to the ends of four rods or draw bars 40, 42, 44, 46 projecting outwardly from the cabinet G through suitable apertures in the plate 10. The other ends of the draw bars 40, 42, 44, 46 are connected to a platen 48 located within the cabinet or housing G of the press and adapted to be reciprocated towards and from the plate 10 to open and close the die assemblies by the toggle linkage mechanism D. The platen 48 is provided with a guide in the form of a bar 50 projecting through a suitable aperture in the left-hand end of the platen, as viewed in FIG. 2, and having

its upper end fixedly secured in the plate 10 and its lower end slidably received in an aperture in a member 52 fixed, as by welding, to the wall of the housing or cabinet G opposite to the plate 10.

The toggle linkage mechanism D for reciprocating the platen 48 and in turn the movable die means C comprises two sets of toggle links connected to the side of the platen 48 facing the plate 10 adjacent to opposite end thereof, as viewed in FIG. 2, and to the adjacent side of the plate 10. The first set of toggle links comprise two links 60 having their one ends pivotally connected to opposite ends of a shaft 64 carried by a pair of brackets 66, 68, fixedly secured to the side of the table 10, facing the platen 48, as by bolts, welding, etc. The opposite ends of the links 60 are pivotally connected to opposite ends of a shaft 70 to which shaft the one ends of the links 72 of the toggle mechanism are also pivoted. The other ends of the links 72 are pivotally connected to a shaft 76 carried by brackets 80, 82 fixedly connected as by bolts, welding, etc., to the side of the platen 48 facing the plate 10. The two shafts 64, 76 are in the same plane normal to the outer surface of the plate 10 and parallel with the length of the rods or drawbars 40, 42.

The second or right-hand set of toggle links comprise two links 88, similar to the links 60 of the first set and like the links of the first set, pivotally connected to opposite ends of a shaft 92 carried by brackets fixedly connected to the side of the plate 10 facing the platen 48. The other ends of the links 88 are pivotally connected to opposite ends of a shaft 98 to which shaft the one ends of a pair of links 100 of the second set of toggle links are also pivotally connected. The other ends of the links 100 are connected to a shaft 104 carried by brackets fixedly connected to the side of the platen 48 facing the plate 10. The shafts 92, 104 lie in the same plane normal to the outer surface of the plate 10 and parallel to the length of the rods or drawbars 44, 46.

The two sets of toggle links are connected together by links 110, 112 opposite ends of which are pivotally connected to the shaft 70, 98. The links 110, 112 are spaced from one another and from the other links on the shafts 70, 98, by suitable spacers. The right-hand end of the links 110 and 112, as viewed in FIG. 2, extend a short distance to the right of the shaft 98 and are connected by a cross member 120 to which is connected the left-hand end of a piston rod 126 of a reciprocating-type, double acting hydraulic actuator H, including the cylinder assembly 128. The right-hand end of the cylinder assembly 128 of the hydraulic actuator H is pivotally connected to a shaft 130 extending between oppositely projecting sides of a heavy metal channel member 132 which in turn is connected to the underside of a heavy metal, rectangular, tubular member 134, fixedly connected to the side of the plate 10 facing the interior of the cabinet. G. The piston rod of the actuator H is in line with the guide member 50 so that the thrust of the actuator is taken by the guide member 50 rather than the draw bars which connect the members 34, 48. The toggle linkage mechanism D is so constructed that when the dies are closed the links thereof are at or approximately at dead center thus assuring closing the dies to a predetermined relative position upon each actuation of the press. The toggle linkage mechanism preferably limits the extent that the

dies close upon each operation of the press such that the opposed portions of the dies are slightly spaced from one another when the press is closed.

The aperture or cavity E formed by the dies or die assemblies B, C when the press is closed, preferably is irregular in transverse cross-sectional shape, has a major and a minor dimension with the major dimension inclined to the direction of movement of the movable die, and may be similar to that of a commercially available meat product, for example, a slab of bacon, a ham, or a loin. The recesses or cavities 18 and 36, in the respective die inserts also preferably blend with the adjacent side walls of the die box, have opposed relatively flat portions inclined to the direction of the relative movement between the die inserts, and are oriented such that the long transverse dimension is askew to the path of movement of the movable die and such that the forces applied to a product being compressed transversely of the direction of relative movement between the die means upon the closing of the press is greater than would otherwise be the case. The side edges of the die cavities are offset in the direction of relative movement between the die means relative to one another so as to increase the size of their opening, that is, the openings into the die cavities. The provision of this type of die means having large cavity openings facilitates loading of the press. This is especially advantageous if the product to be compressed is initially distorted so as to make its entrance into the die cavities difficult, such as, being curved with reference to its length.

Clearance between the stationary and movable dies B, C, is preferably very small, only sufficient to provide an adequate path for escaped air and the like, but not large enough to allow product being compressed to be forced therethrough. Clearances on the order of about 0.0075 inch per side, have been found satisfactory. The facing sides of the die inserts 16, 30 preferably do not touch one another at any place although the side edges thereof closely approach each other. This, together with the fact that the cavities 18 and 36 preferably extend to, or substantially to, and blend into the sides of the stationary die avoids any possibility of the dies not properly closing because of the presence of product entrapped between opposed flat planar surfaces about the periphery of the die cavities. When the die inserts 16, 30 do not touch one another along their adjacent side edges, portions of the inner planar sides of the members 20, 22 of the die box cooperate with the cavities 18, 36 to form the die aperture E. The die insert or member 30 is detachably connected to the platen 34 by machine screws 138 and dowels 136. The dowels 136 are employed to assure proper location of the member 30 equally between the sides of the die box.

The ram F, as previously mentioned, conforms to the aperture or cavity E between the die means when the press is closed with a clearance of about 0.006 inches thereabout, and is adapted to be reciprocated in the aperture E by a reciprocating-type, double acting hydraulic actuator J including a piston rod 140 projecting from a cylinder assembly 142 through a suitable packing gland 143 at or adjacent to the left-hand end of the cylinder assembly, as viewed in the drawings. The ram F is connected to the projecting end of the piston rod 140. The cylinder assembly 142 is supported by

suitable brackets on the outer side of the plate 10 and is located at the right-hand side of the fixed die means B, a distance such that no portion of the piston rod 140 which is retracted into the cylinder assembly 142 moves into the cavity E thereby avoiding possible contamination of products being compressed by contaminants, such as oil, adhering to the piston rod 140 incident to its movement into and out of the stuffing box at the left-hand end of the cylinder assembly. The stroke of the actuator J and the distance of the cylinder assembly 142 from the dies is preferably not less than the length of the die apertures E, and such that the ram F can be used to eject a compressed product through the left-hand end of the lower die, if desired.

The right-hand ends of the die cavities are preferably open except for the ram F and when the press is closed, the left-hand end of the aperture or cavity E formed by the die means is closed by a plate 150 bolted or otherwise suitably fixed to the left-hand end of the platen 34. The plate 150 projects over the end of the die cavity in the die means 30 and closes the cavity E when the press is closed with the free end of the plate engaged between the left-hand end of the fixed die assembly and a member 152 bolted or otherwise suitably fixed to the left-hand end of the plate 10. The member 152 acts as a support or backup for the free end of the plate 150. A small clearance may be provided between the end of the die means B, C and the plate 150 for the escape of air from the end of the die aperture E, if necessary. Alternatively one or more small apertures extending through the plate 150 may be provided. In order to prevent any possible spreading of the upper ends of the side members 20, 22 of the die box, one or more abutment or stop members 154, 156 can be connected to the platen 34 in a position such that they are adjacent to the outside sides of the top of the die box when the press is closed. The inner upper corners of the members 154, 156 are preferably broken or relieved as indicated at 158 to allow the escape of any product material that may be entrapped between the upper ends of the die box 14 and the platen 34. The apertures 158 preferably increase in cross-section from about their midpoint to their ends.

Fluid pressure, preferably liquid, for operating the actuators H, J, can be supplied in any convenient manner, such as, by the provision of a motor driven fluid pump within the cabinet G. The actuators are preferably hydraulically-operated and the pressure liquid for operating the same is preferably obtained from a source outside of the cabinet connected to supply and return conduits or fittings 160, 162 at the right-hand side of the cabinet which fittings are in turn connected to conduits 164, 166 connected to suitable three-way valves 170, 172, at the near side of the cabinet, as viewed in FIGS. 1 and 2. The valves 170, 172 are in turn connected to the actuators H, J, respectively, by suitable fluid lines or conduits. The conduits 174, 176, connecting the fluid valve 170 with the actuator H, preferably comprises quick disconnect fittings fixed to the member 132 so that when it is desired to remove the plate 10 and the parts carried thereby the hydraulic lines to the valve 170 can be readily disconnected. Similar quick disconnect fittings are employed in the fluid lines 180, 172 connecting the valve 172 with the actuator J. These fitting may be car-

ried on the side of the plate 10 which faces the interior of the cabinet.

In the embodiment illustrated, the cylinder assembly 142 of the ram actuator is stationary and the ram F is connected to the movable piston rod 140. It is to be understood, however, that the cylinder-position assembly J can be turned end for end with the projecting end of the piston rod connected to a stationary member, such as, a bracket on the plate 10, and the cylinder movably supported with the ram either directly connected to the cylinder assembly in which event the ram might have a length equal to the stroke of the cylinder-piston assembly or the ram could be connected to the cylinder assembly through an intermediate member capable of being received in the die cavity.

The stationary die assembly B, shown in the preferred embodiment, comprises the die box 14 and the insert die member 30. This facilitates changing dies as it is merely necessary to replace one set of inserts by another set having desired different cavities therein. Handling of the die assemblies may be facilitated by attaching the movable die insert to a plate-like member adapted to rest upon the top of or on an outwardly facing surface of the die box as illustrated in FIG. 4, where a die insert 30', in all essential respects similar to the die 30, is carried by a plate 190 which plate is in turn detachably connected to the platen 34. The plate 190 is slightly wider than the die 30' and the projecting edges extend into apertures in the projecting ends of the adjacent side walls of the die box 14. When the die assembly C is so constructed the die assemblies may be handled as a unit and be readily installed in the press by first placing the stationary die assembly adjacent to, or in the case of a vertical press, on the plate 10 and securing it thereto as by machine screws extending through the plate 10 and having threaded engagement in suitably tapped holes in the cross plate 24 of the die box and, if desired, the insert 16. The movable die means or assembly C can thereafter be placed against or on the stationary die assembly B with the flanges provided by the projecting edges of the plate 190 engaging and/or resting upon the top of the die box or ledges provided by apertures in the projecting ends of the side walls of the die box. With the platen 34 positioned closely adjacent to the plate 190 the movable die assembly can be readily attached to the platen 34 by machine screws and dowels extending through the platen 34 and engaged in suitable apertures in the plate 190 and, if desired, the insert 30'.

Die inserts of smaller size can be readily employed by using side filler members in die box 14. When filler plates are employed in a die box of given size, it will be apparent that die inserts will be of less width than the width of the die box without the filler members and will form a smaller product aperture. As a further alternative construction, dies having multiple product apertures E-2, E-3 rather than the single aperture E, of the preferred embodiment, can be provided as illustrated in FIG. 5. This, however, usually requires a die box 210 of greater width than the die box shown in the preferred embodiment and one having a central partition, such as the partition 212. The two sets of die inserts are designated 214, 216 and 218, 220.

As a further suggested alternative construction, the die assemblies shown can be made integral or in one

piece, as illustrated in FIG. 6, rather than consisting of two or more parts. In FIG. 6 the stationary and movable die members are designated M, N, respectively, and the product aperture therebetween E-2. The aperture E-3 is a duplicate of the aperture E and the product apertures E-a, E-e, E-3 are generally similar to E. It is also to be understood that the configuration of the product aperture may be of any desired shape. A suggested alternate shape to that shown in the preferred embodiment is illustrated in FIG. 7. The aperture E-4, shown in FIG. 7, is essentially oval or diamond-shaped with the long axis thereof being inclined to the direction of movement of the movable die assembly. The stationary and movable die inserts shown in FIG. 7 are designated 222, 224, respectively. The other parts of the press shown are similar to the corresponding parts of the preferred embodiment and are designated by the same reference characters.

The press A, illustrated, is a vertical-type press with the movable die traveling linearly in a vertical direction. It is to be understood, however, that the movable die may be moved in an arcuate path. The right-hand end of the movable die, or more preferably an extension thereof, for example, could be pivoted near the right-hand end of the press and the left-hand end oscillated about the connection by the hydraulic actuator, etc. Alternatively, the dies could be rotated 90° about their longitudinal axis and the movable die either reciprocated or oscillated in a horizontal path rather than a vertical path.

The ram F shown is rather short referring to its direction of movement in the die cavity and is typically made of stainless steel as are the dies B, C. As previously suggested, however, the ram F might be as long or longer than the stroke of the cylinder assembly J. If the ram F has substantial length it is necessary that the right-hand end of the cavities in the dies be open to permit its reciprocation therein. As previously suggested, the ram may be made of a nontoxic and/or edible plastic, for example, Nylon. This is also true of the dies B, C. The use of such material is particularly advantageous as it is nonporous, will not absorb bacteria, is highly resistant to acids and alkalines, has a clean appearance, becomes whiter with age, is light in weight, can be easily cleaned and is a poor conductor of heat which is advantageous in a press used to reform frozen products. Nylon being slightly elastic is particularly advantageous when used as ram material because the manufacturing tolerances are less than with metal and the leading peripheral parts flex acting as a wiper seal thus preventing extrusion or leakage of product around the ram, etc.

From the foregoing it will be apparent that the objects and advantages heretofore enumerated have been accomplished and that there has been provided a novel and improved press of the character described for compressing comestible products which is simple in construction, reliable in operation, will produce a product of predetermined shape and density, and in which the openings to the die cavities are larger than usual.

While the preferred embodiment of the invention has been described in considerable detail, it is to be understood that the invention is not limited to the particular construction shown and referred to and it is the intention to hereby cover all adaptations and modifica-

tions thereof which come within the practice of those skilled in the art to which the invention relates and the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a press for shaping comestible products, such as meat or the like having: a first integral die; a second integral die; and mechanism for producing relative movement between said dies to and from one another; each of said dies having in the sides thereof facing one another an elongated die cavity of uniform cross-sectional shape, said dies when together forming a tubular aperture of non-cylindrical uniform cross-sectional shape having major and minor axes with a major axis inclined to the path of relative movement between said dies, said first integral die having spaced parallel sides extending from the longitudinal side edges of said first die cavity, and said side of edges of each of said die cavities being offset relative to one another in the direction of relative movement between said dies.

2. A press for shaping comestible products, such as meat or the like having: a stationary die support; an integral channel-shaped first die connected to said stationary support and having an elongated cavity of uniform cross-sectional shape in one side thereof; a movable die support; a second integral die connected to said movable die support and having a portion receivable in the channel of said first die and having a second elongated cavity of uniform cross-sectional shape in the portion receivable in the channel of said first die and in the side thereof opposite to said one side of said first die; mechanism for moving said movable die support to and from a position adjacent to said stationary die support and in which said cavities in said dies form a tubular aperture of non-cylindrical uniform cross-sectional shape having major and minor axes with at least the major axis inclined to the path of movement of said movable die support; said first die having spaced parallel sides extending from side edges of the first die cavity, said side edges being offset relative to one another in the direction of movement of said movable die support; a ram conforming to the cross-sectional shape of said aperture formed by said first and second die when closed; and mechanism for reciprocating said ram.

3. A press for shaping comestible products, such as meat or the like having: a stationary die support; a first integral die connected to said stationary support and having a channel in one side thereof with spaced parallel side portions and an elongated cavity of uniform cross-sectional shape in the bottom of the channel with side edges adjoining ends of said parallel side portions, said cavity extending the full width of the bottom of the channel; a movable die support; a second integral die connected to said movable die support and having a portion receivable in the channel of said first die with a second elongated cavity of uniform cross-sectional shape in the side of said second die opposite to said one side of said first die, extending the full width thereof, and terminating in longitudinal side edges; mechanism for moving said movable die support to and from a position adjacent to said stationary die support and in which said cavities in said dies form a tubular aperture of uniform cross-sectional shape having major and minor axes with at least the major axis inclined to the path of movement of said movable die support; the side

edges of each die cavity being offset relative to one another in the direction of movement of said movable die support; a ram conforming to the cross-sectional shape of said aperture formed by said first and second dies when closed; and mechanism for reciprocating said ram.

4. A press for shaping comestible products, such as meat or the like having: a stationary die support; a channel-shaped first integral die connected to said stationary support and having an elongated cavity of uniform cross-sectional shape in one side thereof opening into one end of said die and extending the full width of the bottom of the channel; a movable die support; a second integral die connected to said movable die support and having a portion receivable in the channel of said first die with a small clearance thereabout and having a second elongated cavity of uniform cross-sectional shape in the portion receivable in the channel of said first die in the side thereof facing said one side of said first die and extending the full width of said portion; mechanism for moving said second die to and from a position adjacent to said first die and in which said cavities in said dies form a tubular aperture of non-cylindrical uniform cross-sectional shape having a major and minor axis with the major axis inclined to the path of movement of said movable die support; a ram conforming to the cross-sectional shape of said aperture formed by said first and second dies when closed; and mechanism for reciprocating said ram.

5. A die assembly for shaping a comestible product such as meat or the like, comprising: a channel-shaped first integral die having spaced parallel surfaces facing one another and an elongated outwardly facing die cavity in the bottom side of the channel extending the full width between said spaced surfaces and extending lengthwise thereof, of uniform cross-sectional shape having at least one end open and side edges adjoining said parallel surfaces offset relative to one another; and a second integral die constructed to be at least partially receivable between said spaced parallel surfaces of said first die when said dies are closed and having a second elongated die cavity of uniform cross-sectional shape at least one end of which is open facing said die cavity in said first die, said second die cavity being in the part of said second die received between said spaced surfaces, extending the full width of the receivable part, and terminating in longitudinal side edges offset relative to one another; said cavities forming when said dies are closed an elongated aperture of uniform cross-sectional shape having a major and a minor axis with at least said major axis inclined to said parallel surfaces.

6. A die assembly for shaping a comestible product such as meat or the like, comprising: a channel-shaped first integral die having spaced parallel surfaces facing one another and an elongated outwardly facing die cavity in the bottom side of the channel extending the full width between said spaced surfaces and extending lengthwise thereof, of uniform cross-sectional shape open at one end between the adjacent ends of said spaced surfaces and having side edges adjoining said parallel surfaces offset relative to one another; and a second integral die constructed to be at least partially receivable between said spaced surfaces of said first die when said dies are closed and having a second elongated die cavity of uniform cross-sectional shape at

least one end of which is open facing said die cavity of said first die, said second die cavity being in the part of said second die received between said spaced surfaces, extending the full width of the receivable part, and terminating in longitudinal side edges offset relative to one another an amount equal to the offset of said side edges of said die cavity of said first die but in the reverse direction; said cavities forming when said dies are closed an elongated aperture of uniform cross-sectional shape having a major and a minor axis with at least the major axis inclined to said parallel surfaces.

7. A press for shaping a comestible product such as meat or the like, comprising: a stationary support, a movable die carrier on said support, a channel-shaped stationary integral die means carried by said support and having spaced surfaces facing one another parallel to the plane of movement of said movable die carrier and an elongated outwardly facing die cavity of uniform cross-sectional shape at least one end of which is open, and extending the full width between the ends of said spaced surfaces remote from said movable die carrier and having side edges adjoining said parallel surfaces offset relative to one another in the direction of movement of said movable die carrier, a movable integral die means secured to said movable die carrier and constructed to be at least partially receivable between said spaced surfaces of said stationary die means and having a second elongated die cavity of uniform cross-sectional shape open at both ends in the part receivable between said spaced surfaces and facing said die cavity in said stationary die means, said second die cavity extending the full width of the part received between said spaced surfaces and terminating in longitudinal side edges offset relative to one another in the direction of movement of said movable die carrier an amount equal to the offset of said side edges of said die cavity of said stationary die means but in the reverse direction, means to move said movable die carrier and the movable die means carried thereby between a first position spaced from said stationary die means and a second position in which said movable die means extends into said stationary die means to form with the stationary die means an elongated aperture of uniform cross-sectional shape having a major and a minor axis with the major axis inclined to the plane of movement of said movable die carrier, a ram conforming in shape to the aperture cross-section and closely receivable within said aperture, a ram actuator on said support for reciprocating said ram longitudinally within said aperture from one end thereof.

8. A die assembly for shaping comestible products, such as meat or the like, comprising: first and second integral die members adapted to be moved towards and from one another, said first die member having a flat base, parallel side portions extending from the base for receiving said second die member and a concave connecting portion of uniform cross section extending the full width between said side portions, the junctures between said connecting portion and both side portions being straight and parallel, one being offset from, i.e., a different distance from said base than, the other, and said second die member having a portion receivable between said parallel side portions that terminates in a cavity of uniform cross section facing said connecting portion; said die members forming a tubular aperture

of non-cylindrical uniform cross-sectional shape having a major axis inclined to the planes of said parallel side portions when said second die member is received in said first die member.

9. A die assembly as claimed in claim 8 wherein a portion of at least one of said parallel sides of the first die member forms a part of said tubular aperture.

10. A press for shaping a comestible product such as meat or the like, comprising: a stationary support, a movable die carrier on said support, a channel-shaped stationary integral die means carried by said support and having spaced surfaces facing one another parallel to the plane of movement of said movable die carrier and an elongated outwardly facing die cavity of uniform cross-sectional shape between the ends of said spaced surfaces remote from said movable die carrier and having side edges along said parallel surfaces offset relative to one another in the direction of movement of said movable die carrier, a movable integral die means secured to said movable die carrier and constructed to be at least partially receivable between said spaced surfaces of said stationary die means and having a second

elongated die cavity of uniform cross-sectional shape in the part receivable between said spaced surfaces and facing said die cavity in said stationary die means, said second die cavity terminating in longitudinal side edges offset relative to one another in the direction of movement of said movable die carrier an amount equal to the offset of said side edges of said die cavity of said stationary die means but in the reverse direction, means to move said movable die carrier and the movable die means carried thereby between a first position spaced from said stationary die means and a second position in which said movable die means extends into said stationary die means to form with the stationary die means an elongated aperture of uniform cross-sectional shape having a major and a minor axis with the major axis inclined to the plane of movement of said movable die carrier, a ram conforming in shape to the aperture cross-section and closely receivable within said aperture, and a ram actuator on said support for reciprocating said ram longitudinally within said aperture from one end thereof.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,704,665 Dated December 5, 1972

Inventor(s) Louis A. Bettcher

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 64, a new paragraph should have been started after the word "ram."

Column 2, line 1, "good" should be --food--.

Column 2, line 53, "cross-section" should be --cross-sectional--.

Column 4, line 43, insert after the word "36" --in the dies 16 and 30--.

Column 7, line 6, "E-a, E-e" should be --E-1, E-2--.

Signed and sealed this 17th day of April 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents