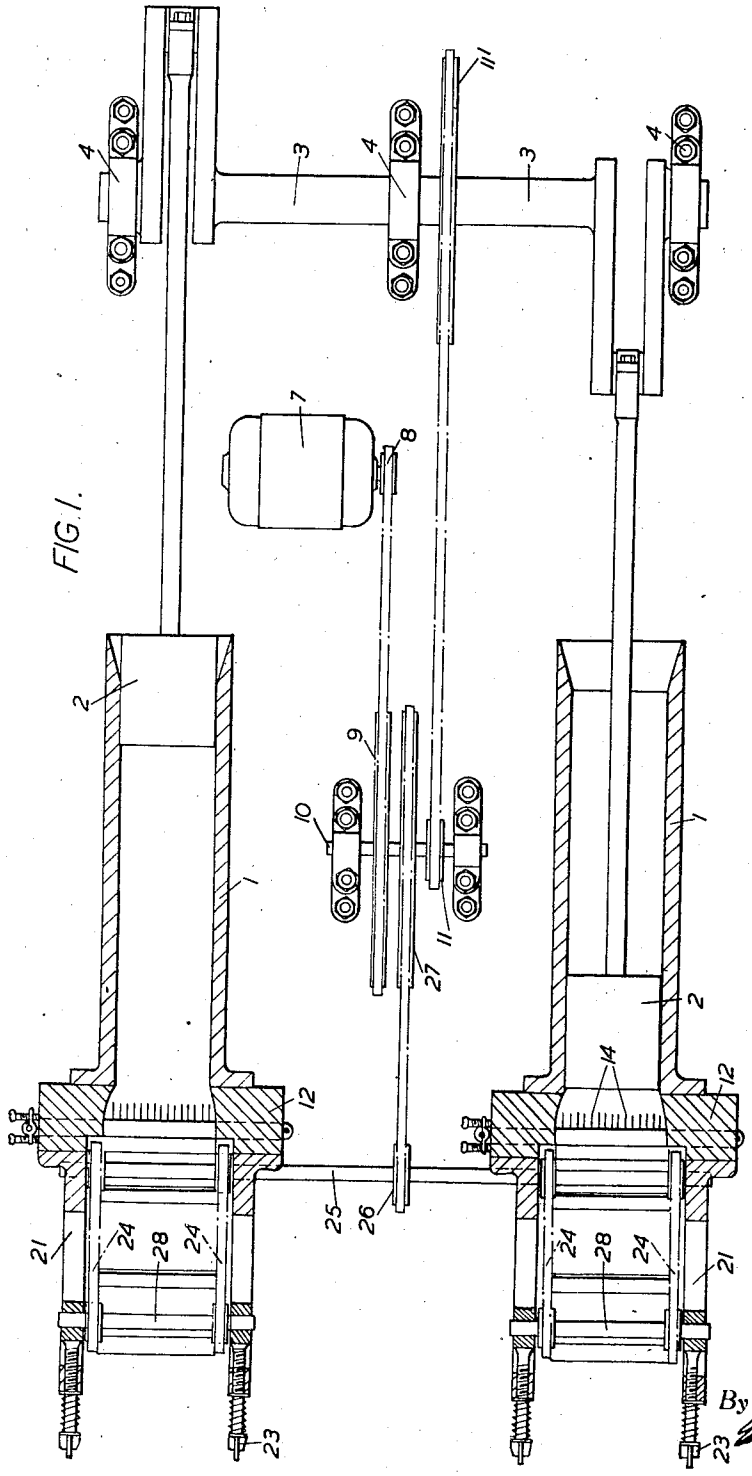
Oct. 9, 1945. A. WEINER 2,386,730

MACHINE FOR SUB-DIVIDING BLOCKS OF GLUE AND OTHER MATERIALS INTO SMALL PIECES

Filed April 10, 1944 3 Sheets-Sheet 1

FIG. 1.



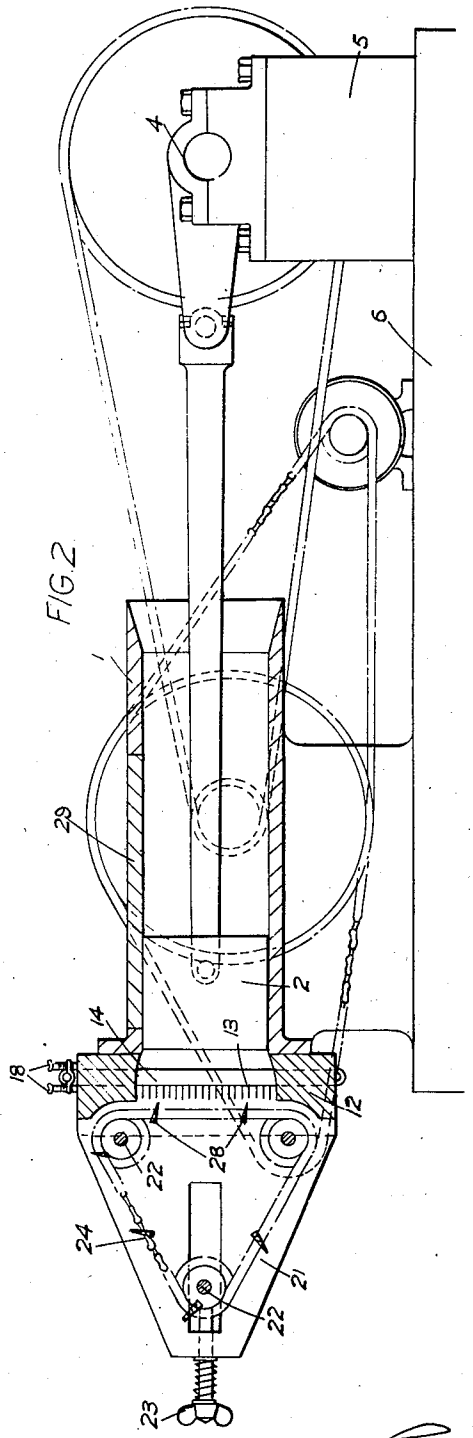
Inventor
A. WEINER
By
Attorneys

Oct. 9, 1945. A. WEINER 2,386,730

MACHINE FOR SUB-DIVIDING BLOCKS OF GLUE AND OTHER MATERIALS INTO SMALL PIECES

Filed April 10, 1944 3 Sheets-Sheet 2

FIG 2



Inventor
A. WEINER
By
Attorneys

Oct. 9, 1945. A. WEINER 2,386,730

MACHINE FOR SUB-DIVIDING BLOCKS OF GLUE AND OTHER MATERIALS INTO SMALL PIECES

Filed April 10, 1944 3 Sheets-Sheet 3

FIG. 3.

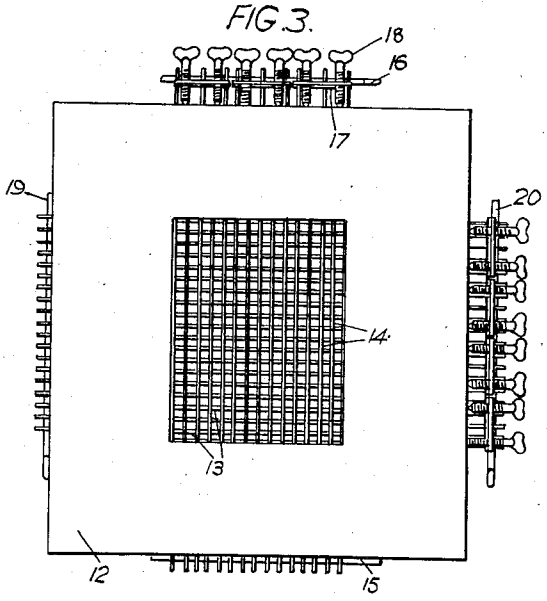


FIG. 3b.

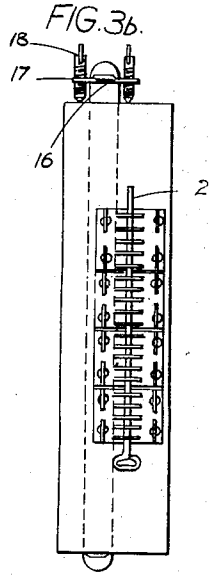


FIG. 3a

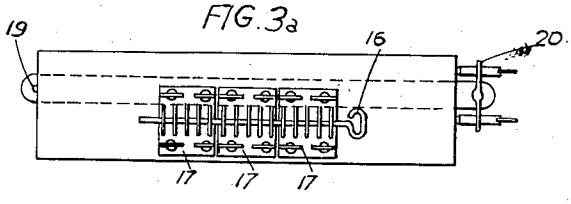


FIG. 4.

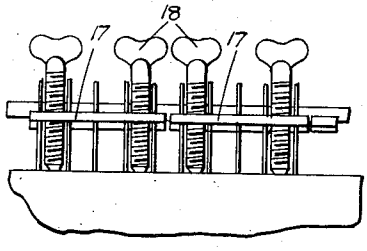


FIG. 4a.

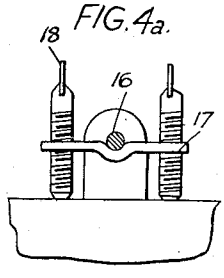


FIG. 5.

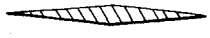
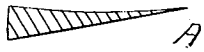


FIG 6



Inventor
A. WEINER

By
Attorneys

Patented Oct. 9, 1945 2,386,730

UNITED STATES PATENT OFFICE

2,386,730

MACHINE FOR SUBDIVIDING BLOCKS OF GLUE AND OTHER MATERIALS INTO SMALL PIECES

Arnost Weiner, Halfway, England

Application April 10, 1944, Serial No. 530,433
In Great Britain April 27, 1943

3 Claims. (Cl. 164—38)

This invention relates to a machine for subdividing a block of glue, or other material, into small pieces such as dice or cubes.

As is well known, glue and like colloidal materials are usually produced in the form of sheets of various thicknesses which have to be dried to the required moisture content. The drying, however, is a very uneconomical process and, in order to reduce the time required for drying and the cost, the tendency has been to reduce the size of the cake or sheets and it has been proposed to produce the glue in the form of cubes, dice or other small pieces. Glue in the form of small pieces has the further advantage that it is more convenient for the user in as much as the quantity required can be more easily gauged, the soaking time is shorter and the quality of the glue can be estimated more easily by the consumer.

Now the object of the present invention is to provide an improved machine which is simple and inexpensive and can readily be installed in any glue factory, whereby a block of glue is directly converted into small pieces without the necessity for first cutting it into slices.

According to the invention, the machine comprises a cutter frame having intersecting sets of blades or wires, a guide box for the reception of the block of glue associated with the cutter frame, a plunger which is reciprocated in the guide box and by which the block is forced through the cutter frame, and a movable knife, or knives, which continuously cut through the slit end of the block as it emerges from the cutter frame, so as to produce with each cut a number of small pieces. The machine may suitably comprise two similar units which operate alternately so that a fresh block can be introduced into the one unit while the block in the other unit is being sub-divided into small pieces, the operation thereby becoming continuous.

Preferably, the plunger and the movable knife or knives are geared together or driven from a common shaft, so that the thickness of the pieces cut off remains the same, even if the speed of the plunger varies owing to differences in the consistency or quality of the glue. The interior edge of the cutter frame is curved outwardly on all sides so that the free passage area through the frame is slightly greater than the cross-sectional area of the block, in order to compensate for the space occupied by the knives of the cutter frame as the block passes through them.

In order that the invention may be easily understood and readily carried into effect, a machine constructed in accordance with the invention is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a plan of the machine;

Figure 2 is a side elevation mainly in section;

Figures 3, 3*a* and 3*b* are respectively an end elevation, top plan and side elevation of the cutter frame;

Figures 4 and 4*a* are detail views on a larger scale showing how the cutting knives are adjustably mounted;

Figure 5 is a section on a larger scale through one of the knives of the cutter frame; and

Figure 6 is a similar section through one of the rotary knives.

Referring to the drawings, the machine comprises two identical units operating alternately and driven from a common motor and crankshaft and like parts of the two units have been indicated by like reference numerals.

Each unit comprises a guide box 1 of which the internal shape corresponds to that of the block of glue to be sub-divided and in which a plunger 2 is slowly reciprocated. Each plunger is driven from a common crankshaft 3 of which the two cranks are set at 180°, so that as one plunger moves forward, the other moves backwards. The crankshaft 3 is carried in bearings 4 supported by brackets 5 on a bed-plate 6 on which the guide boxes 1 are also fixed and is driven from a geared motor 7 by two chain drives, one chain running on a chain wheel 8 mounted on the motor shaft and a chain wheel 9 on a countershaft 10 and the other chain running on a chain wheel 11 on the countershaft and a chain wheel 11′ mounted on the crankshaft.

To the open end of each guide box 1 is fixed a cutter frame 12 which carries a set of horizontal cutting knives 13 and a set of vertical cutting knives 14 which are arranged in two planes one behind the other and form a grid-like structure as shown in Figure 3. The vertical knives pass through slits in the frame 12 and at the lower side of the frame they are all secured in position by a common pin 15 which passes through holes provided in the projecting ends of the knives and is supported against the edge of the frame. At the upper ends the vertical knives also pass through slits in the frames and they are supported in groups by means of a pin 16 which passes through holes in the projecting ends of the knives and, instead of being supported directly on the frame, rests in a number of supporting plates 17 which are carried by thumb screws 18, the ends of which bear against the edge of the frame 12 so that any slackness

of the knives can be taken up while the machine is running by adjusting the screws 18. Instead of a single pin, a separate pin might be provided for each group of knives. The horizontal knives are adjustably mounted in a similar manner by means of a pin 19 passing through holes in the projecting ends of the knives at one side and supported by the edge of the frame and a pin 20 passing through holes in the projecting ends of the blades on the opposite side and adjustably supported in a similar manner to the upper ends of the vertical knives. The shape of both the vertical and horizontal knives is as shown in cross-section in Figure 5.

As will be seen from Figures 1 and 2, the inside of the frame is slightly curved on all sides so that its passage area is somewhat greater than the cross-sectional area of the guide box 1 to allow for the space taken up by the cutting knives and to permit the glue to be displaced slightly while being cut.

To each side of the cutter frame 12 is fixed a bracket 21 which carries three chain wheels 22 which are arranged in the form of a triangle as shown in Figure 2. The two chain wheels adjacent the frame are rotatable, but otherwise fixed in position while the third chain wheel at the apex of the triangle is carried by a part which is adjustable relatively to the other two chain wheels by means of a screw 23. A chain 24 passes round each set of three chain wheels, and one wheel of each set is driven from a common shaft 25 by means of a chain which passes round a chain wheel 26 mounted on the shaft 25, and a chain wheel 27 fixed on the countershaft 10. The two chains carry between them a number of cutting knives 28, which are illustrated in cross-section in Figure 6, and are arranged at an angle to and at a small distance away from the knives of the cutter frame, the distance depending upon the size of the pieces to be cut off, the knives 28 are set at an angle to the cutter frame 12, as shown in Figure 2, to prevent dragging on the glue. The knives 28 might be arranged to pass from side to side across the cutter frame instead of from top to bottom as illustrated.

In order to be able to introduce the blocks of glue each guide box 1 is provided with a door 29 which is of sufficient size to allow the introduction of a block.

The operation of the machine is as follows:

Assuming the parts of the machine to be in the position shown in Figure 1, a block of glue, which may if necessary have been previously cooled, is introduced into the guide box 1 and the plunger 2 moves slowly forwardly and presses the block through the intersecting knives of the cutter frame 12. As the end of the block which has now been sub-divided by intersecting slits emerges from the frame, the knives 28 cut a small piece off the slit ends of the block so as to form small pieces or cubes, depending on the distance of the knives from the frame. The length of the pieces cut off will vary somewhat due to variations in speed of the plungers as their driving cranks travel through different arcs of their paths. However, since the knives 28 are driven from the same shaft as the plungers, no variations will occur in the size of the pieces if the speed of the plunger should vary owing to differences in the consistency or in the quality of the glue.

By fitting more or fewer knives 28 between the chains the thickness of the pieces cut off can be varied within wide limits, so that slices, cubes or rectangular sticks can be produced.

Although the machine has been described in connection with a block of glue, it may also be used for sub-dividing other materials provided they are capable of being cut and have suitable physical qualities.

I claim:

1. In a machine for subdividing a block of glue that comprises a guide box having an outlet end, a plunger movable through the box toward the outlet end, a series of stationary knives arranged in crossing relation to the outlet end, and a series of movable knives arranged to travel across the outlet end in the rear of the stationary knives; a frame mounted at the outlet end of the box and enclosing an opening registering with the outlet, said frame being provided with means for supporting the stationary knives in crossing relation to the opening that it encloses, and the rear portion of the said frame being shaped to provide passage for the movable knives immediately in the rear of the stationary knives and permitting said movable knives to traverse the full opening in one direction and to extend completely across it in the other.

2. A frame according to claim 1, wherein the stationary knife-supporting means includes slots in the opposite sides of the frame and means for securing ends of stationary knives extending across the opening and into the slots, and wherein the shaping of the rear comprises a recess providing clearance for a reach of knife-carrying chain longer than the opening enclosed by the frame and extending across said opening immediately in the rear of the stationary knives.

3. A machine for subdividing a block of glue comprising a guide box secured in fixed position to a base and having an outlet end projecting beyond said base, said box being of uniform cross sectional dimensions throughout its length, a plunger movable through said box toward the outlet end, a series of stationary knives crossing the outlet end, and a series of movable knives arranged to pass transversely across the outlet end of the box outward of the stationary knives.

ARNOST WEINER.