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(54) **Kneading-plasticising machine for the production of food mixes in general and typical plastic curd cheeses in particular.**

(57) The kneading-plasticising machine for the production of food mixes in general and typical plastic curd cheeses in particular comprises a tank, in which kneading implements operate and which is rotatable about an axis.

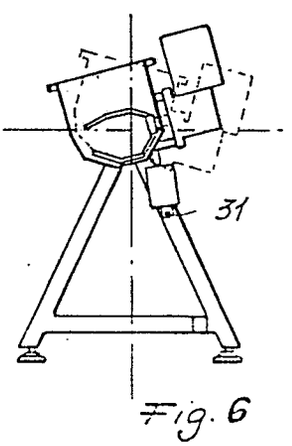

Fig. 6

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KNEADING-PLASTICISING MACHINE FOR THE PRODUCTION OF FOOD MIXES IN GENERAL AND TYPICAL PLASTIC CURD CHEESES IN PARTICULAR

This invention relates to a kneading-plasticising machine for producing food mixes in general and typical plastic curd cheeses in particular. The machine of the invention is of the batch type and comprises a tank in which kneading members operate, driven by a geared motor unit.

With particular but not exclusive reference to the dairy industry it is known to use both continuous and batch machines for producing plastic curd cheeses.

The traditional machines in which the plasticising process takes place continuously have their main weakness in the fact that they are inflexible in the sense that they cannot be used for the production of small batches of different cheeses, as is required by medium or small dairies and by craftsman producers. The reason for this is that these machines cannot be completely emptied, and in the case of such producers whose clientele consumes products in small quantities but of different characteristics (for example mozzarella and provolone), the quantity of residual curd remaining in the machine can be equal to the quantity of curd to be processed. Such producers can obviously not use continuous machines, for economic reasons. In this respect, to obtain 35 kg of plastic curd from a continuous plasticiser, the user would have to process at least 60-70 kg, because the residue in the machine can amount to 25-35 kg.

For the aforesaid reason, a large number of producers use kneading machines which are constructionally complicated, are not specific for this use, and oblige the user to empty the plasticising compartment by hand, so subjecting him to the risk and fatigue of operating with his hands in a space containing implements and in which the processed product and water are at high temperatures, which can be of the order of 65°C and 90°C respectively.

The object of the present invention is to provide a machine of batch type which is more simple than traditional machines and allows the processing compartment to be emptied by gravity without the operator having to touch the processed product.

This and further objects which will be more apparent from the detailed description given hereinafter are attained according to the invention by a machine comprising a tank in which kneading implements operate, and which is characterised essentially in that the tank can be rotated about an axis for its emptying.

Advantageously, the kneading implements are carried by said tank and are constituted by two members which rotate about parallel axes and are provided with a series of arms. Advantageously, the tank can be rotated about the axis either manually or by a drive means such as a cylinder-piston unit.

Furthermore, by suspending the tank on an axis of rotation, the tank can be made to undergo a swinging movement for example manually or by means of a, or the, cylinder-piston drive unit of adjustable stroke, should the product characteristics require this in order to obtain special local typicality effects.

The kneading implements are driven by a geared motor unit of reversible direction of rotation, so that, for example, the implements can be rotated in one direction and then in the other, and so on, for times which can be decided by the operator or set on a conventional timer.

The invention will be more apparent from the detailed description given hereinafter by way of example, with reference to the accompanying drawing in which:

Figure 1 is a perspective view, with parts removed, of the machine according to the invention in its working position;
Figure 1A is a diagrammatic illustration of the tank locking device;
Figure 2 is a perspective view of the machine in its discharge position;
Figure 3 is a detailed view of the connection of an implement to the geared motor output shaft;
Figure 4 is a front view of an implement;
Figures 5, 6, 7 are diagrammatic vertical sections through the machine in three different positions; and
Figure 8 is a plan view.

In the drawing, the reference numeral 1 indicates the trestled support structure of the machine according to the invention. This structure is formed from metal section bars welded together. Each of the structure trestles 2, 3 upperly carries a support 4, 5. The two supports 4, 5 are coaxial, and in them there are rotatably mounted pivot pins 6 which are rigid with and project from the sides of a metal polygonal tank 7 which is internally lined with polytetrafluoroethylene (TEFLON). A handwheel or control wheel 8 is rigid with one of the pivot pins and enables the user to incline the tank 7 about the geometrical axis of the pins 6.

The trestle 2 carries a slidable pedal 9 connected to a cable 10 connected to a locking pin 11 which is mounted in the machine structure 1 and is mobile against a spring 12 in order to engage in one of the notches 13 distributed along a disc or sector 14 rigid with the pivot pin 6 supported on the trestle 2. On pressing the pedal 9, the operator withdraws the locking pin 11 from the notch 13, so that by operating the handwheel 8 he can rotate the tank 7 by the required amount to attain the gravity discharge position shown in Figure 2.

Inside the tank 7 there are situated two identical working implements 14 which can comprise a series of equidistant arms 15 projecting forwards from a hub 16 which is coupled by a diametrical pin 17 to one of the output shafts 18 of a geared motor unit 19 of reversible direction of rotation. Said unit 19 is mounted on pins 20 rigid with the tank 7 on a side thereof which is at a right angle to those sides carrying the pivot pins 6. The unit 19 is fixed to the pins by nuts.

The arms 15 can be two or more than two in number (Figures 1 and 2 show an embodiment with two arms and the other figures show an embodiment with three arms).

The geared motor unit 19 has two output shafts 18, one for each implement, and these latter are mounted out of phase to the extent that the arms of one are located within the inter-arm spaces of the other.

Instead of the handwheel, or possibly combined therewith, and thus possibly allowing the locking device shown in Figure 1A to be dispensed with, there can be provided (see Figures 5 to 8) a hydraulic cylinder-piston unit 30 with its cylinder hinged at 31 to one of the trestles 2, 3, and with its piston rod (not shown) connected eccentrically to one of the pivot pins 6 of the tank 7.

The cylinder-piston unit 30 can be of the adjustable-stroke type, and if associated with a timer and a contact valve, it can be used to subject the tank 7 to swinging movements (see Figure 6) during the product processing, in addition to giving it the inclination (Figure 7) required for gravity discharge of the processed product.

The geared motor unit is of reversible direction of rotation, in the sense that the implements 14 can be made to rotate in one direction and then in the other, for example for predetermined times, and also cyclically. The motion can be reversed either by the operator or by a pre-settable timer.

Claims:

1. A kneading-plasticising machine for the production of food mixes in general and typical plastic curd cheeses in particular, comprising a tank in which kneading implements operate, characterised in that the tank (7) can be rotated about an axis.

2. A machine as claimed in claim 1, characterised in that the axis is substantially horizontal.

3. A machine as claimed in claim 1, characterised in that the kneading implements are constituted by a pair of members (14) rotating about parallel axes and provided with a series of arms (15).

4. A machine as claimed in claim 3, characterised in that the arms (15) are equidistant and project forwards from a common connection member (16).

5. A machine as claimed in one or more of the preceding claims, characterised in that the geared motor (19), the implements (14) and the tank (7) constitute a unit which is rotatable about a substantially horizontal axis.

6. A machine as claimed in one or more of the preceding claims, characterised in that the angular movement is impressed on the rotatable unit manually by means of a handwheel or the like (8).

7. A machine as claimed in one or more of the preceding claims, characterised in that the angular movement is impressed on the rotatable unit by means of a cylinder-piston unit, possibly of variable stroke.

8. A machine as claimed in one or more of the preceding claims, characterised by comprising means for subjecting the unit to swinging movements.

9. A machine as claimed in at least one of the preceding claims, characterised in that the geared motor (19) is of reversible direction of rotation.

10. A machine as claimed in claim 9, characterised in that the direction of rotation is reversed cyclically by means of a reversing device, such as a settable timer.

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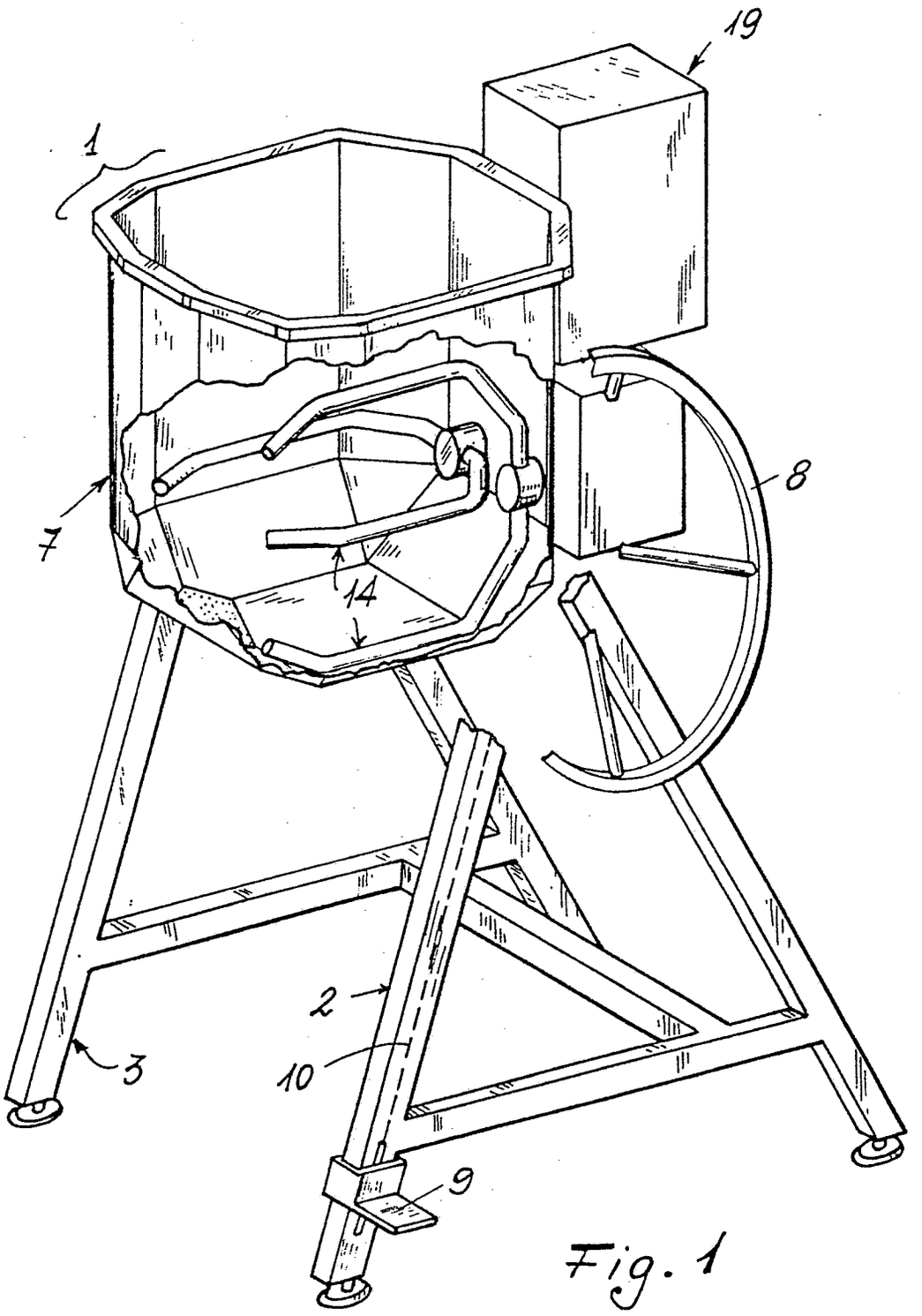

Fig. 1

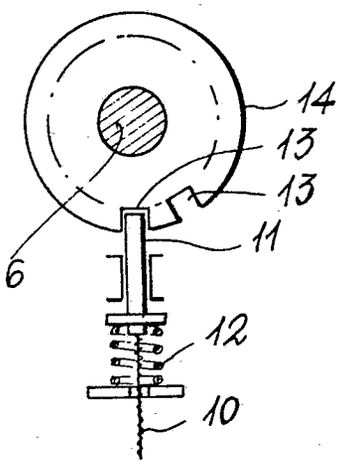

Fig. 1A

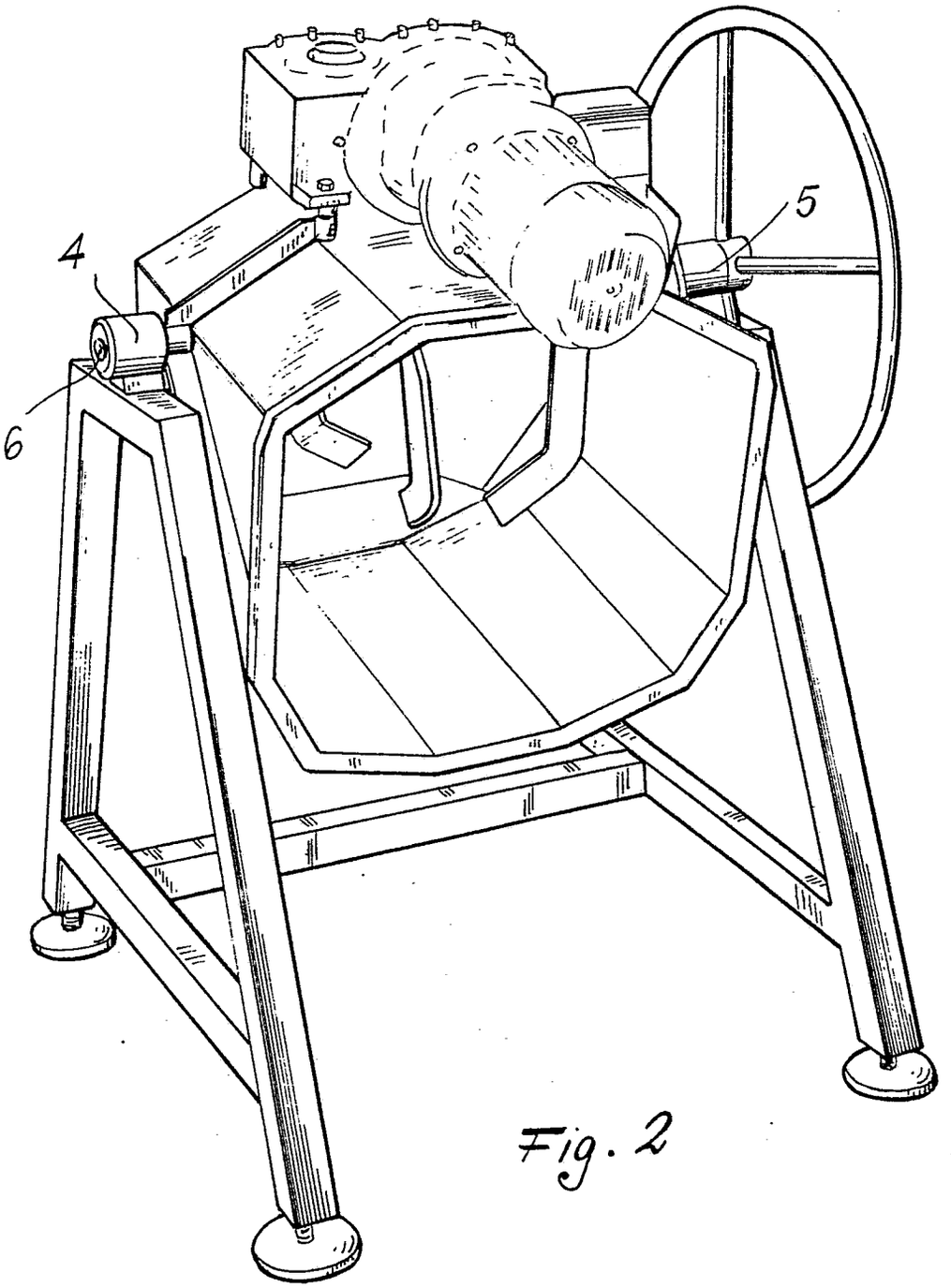

Fig. 2

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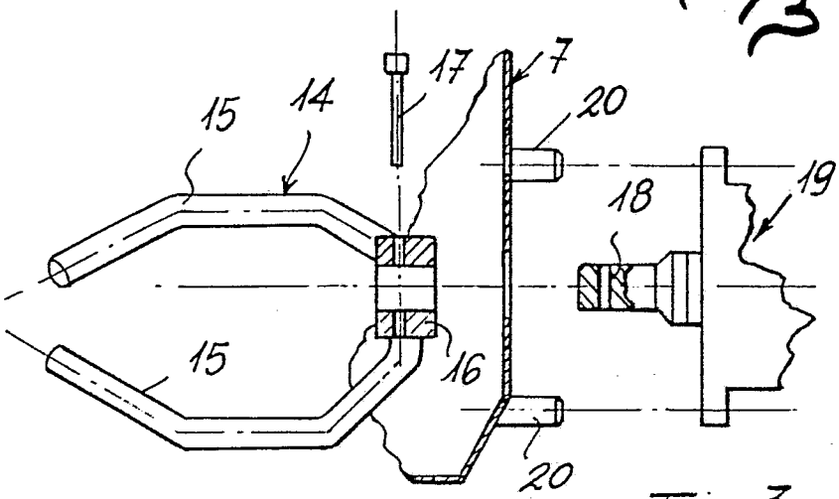

Fig. 3

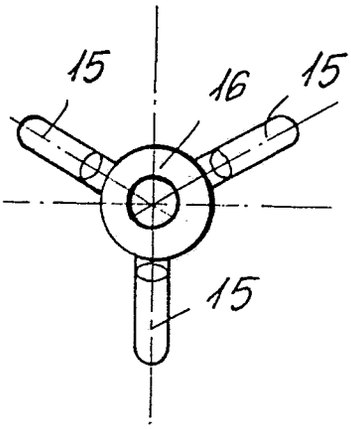

Fig. 4

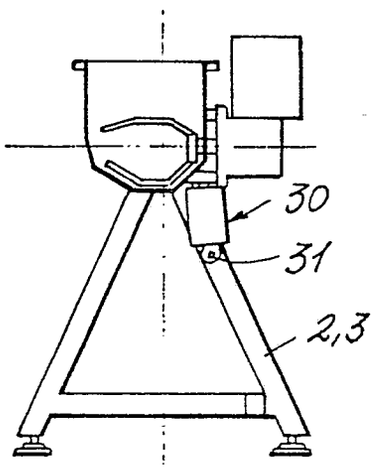

Fig. 5

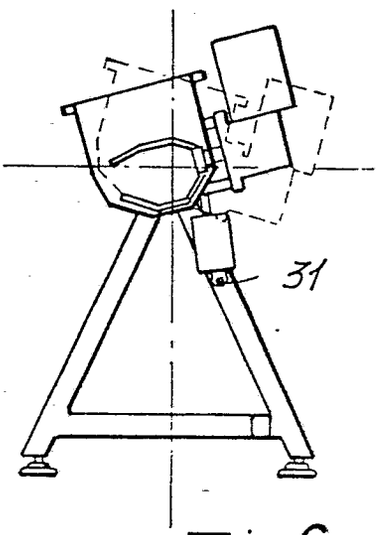

Fig. 6

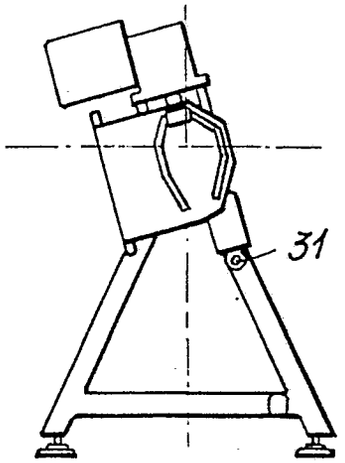

Fig. 7

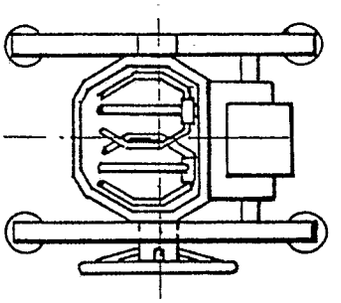

Fig. 8