July 12, 1955

J. F. NAYLOR

2,712,798

DOUGH MOULDING MACHINE

Filed June 24, 1952

3 Sheets-Sheet 1

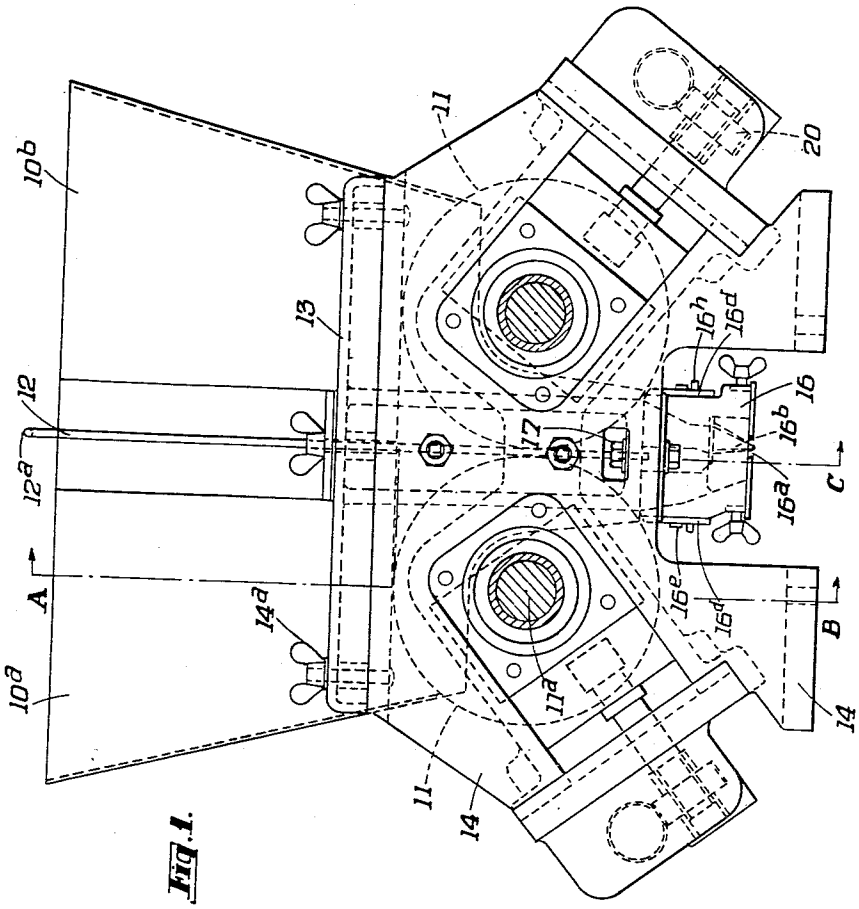


Fig. 1.

Joseph Francis Naylor
Inventor

By
John James Victor Armstrong
Attorney

July 12, 1955

J. F. NAYLOR

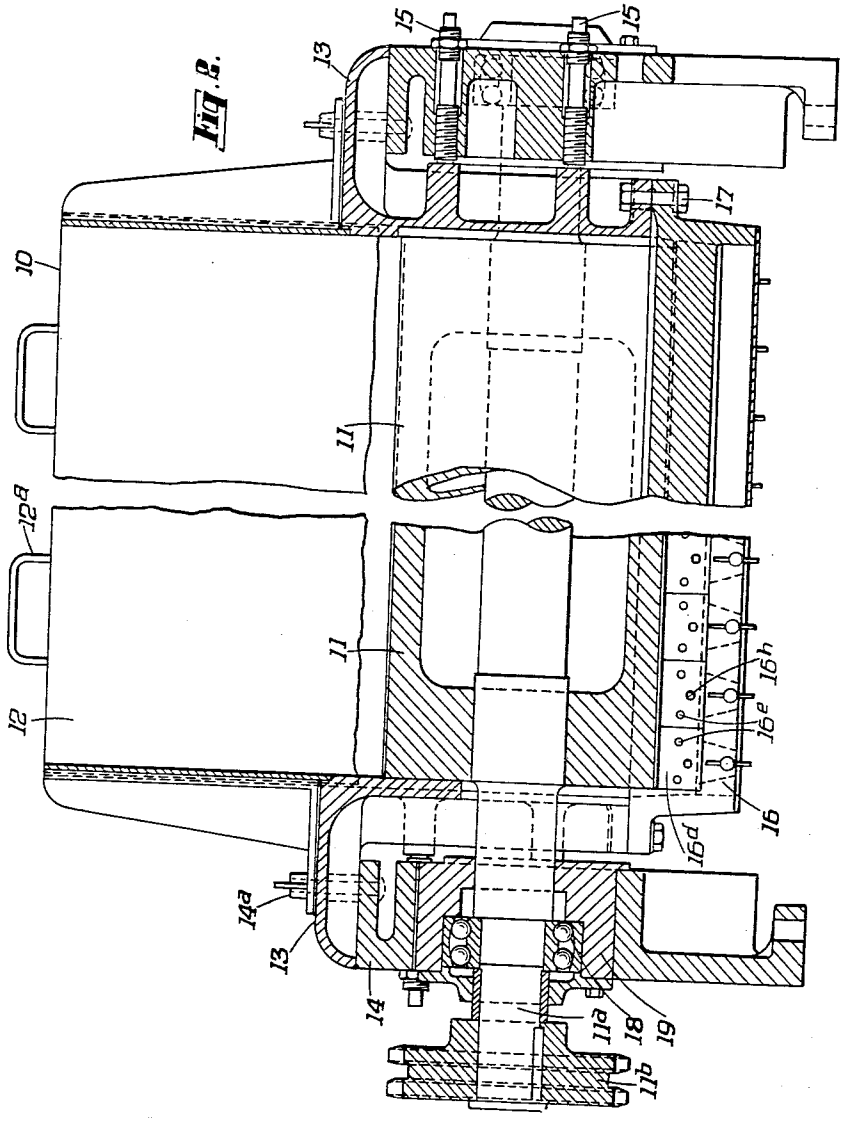
2,712,798

DOUGH MOULDING MACHINE

Filed June 24, 1952

3 Sheets-Sheet 2

Fig. 2.



Joseph Francis Naylor
Inventor

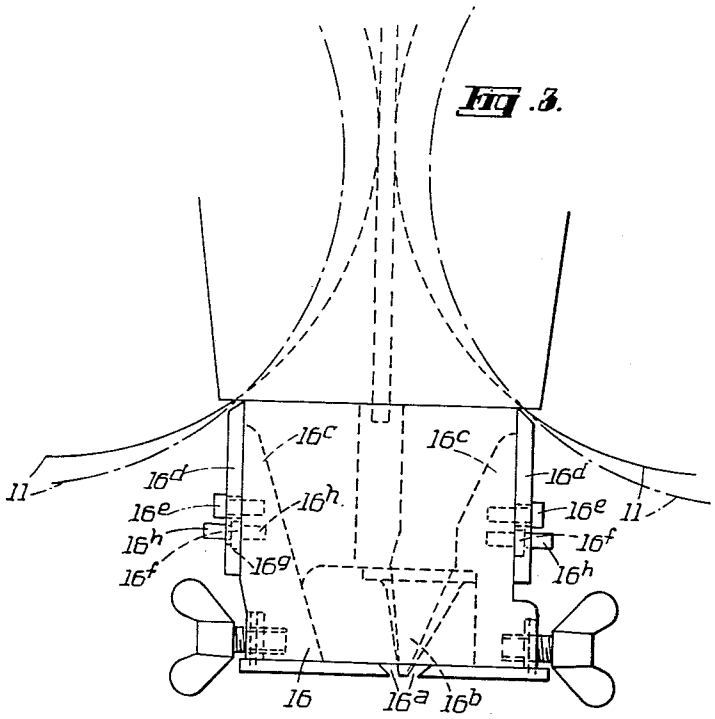
By
John James Victor Armstrong
Attorney

July 12, 1955 J. F. NAYLOR 2,712,798

DOUGH MOULDING MACHINE

Filed June 24, 1952 3 Sheets-Sheet 3

Fig. 3.



Joseph Francis Naylor
Inventor

By John James Victor Armstrong
Attorney

United States Patent Office

2,712,798

Patented July 12, 1955

2,712,798

DOUGH MOULDING MACHINE

Joseph Francis Naylor, Newton-le-Willows, England, assignor to T. & T. Vicars Limited, Earlestown, Newton-le-Willows, England, a British company

Application June 24, 1952, Serial No. 295,239

5 Claims. (Cl. 107—1)

The present invention relates to dough extruding and the like machines of the type wherein a hopper to contain a supply of plastic material is disposed above one or more rollers co-operating with a plate or one with another to form, with side plates and a die box at the base, a compression chamber. A dual hopper may be disposed above the rollers, each section of which having a supply of plastic material from which a roller can feed a compression chamber, each chamber being in communication with apertures, particular to itself, in a common die box.

The plastic material in each section can be different, but they will be simultaneously and separately extruded. One said aperture may be disposed around the other to produce an extruded product having one material disposed around the other.

Such latter construction is known for the production, for example, of fig bars, wherein the material to be extruded through the outer aperture, which in the example would be dough, would be contained in one section, and the material to be extruded through the inner aperture, which in the example would be fig filling, would be contained in the other section.

In known machines of the type set forth, the constructions have been such that when attention is necessary for the purpose of cleaning and/or maintenance, the use of mechanical lifting appliances is required along with the services of a skilled engineer, and the time necessary to complete the operation is considerable.

It is an object of the present invention to provide a machine of the type set forth which is efficient in operation and simple in construction, and readily dismantled and assembled for the purpose of cleaning and maintenance, and further, having a compression chamber volume materially less than hitherto.

According to the present invention, in a machine of the type set forth, the die box is fastened solely to the side plates of the compression chamber. In a preferred form of construction the die box has plates adjustably secured to itself and adapted to act as means to adjust the space for material passing between themselves and the rollers while permitting the adjustment of the rollers relative to the division plate or to one another, as the case may be. The plates may be adjusted to be clear of the rollers to allow sheets of material, conforming approximately in thickness to the clearance, to be withdrawn from the compression chamber and returned, adhering to the peripheral surfaces of the rollers, to the hopper which is arranged to be clear thereof. In this way pressure in the chamber may be relieved if necessary, and by suitable adjustment of the plates the pressure of material being extruded through each die may be equalized.

The invention will be further described by way of example with reference to the accompanying drawings in which:

Fig. 1 is a side elevation of a preferred form of machine according to the present invention,

Fig. 2 is, at the left hand portion thereof, a sectional elevation on the line A—B of Fig. 1, and at the right hand portion thereof, a sectional elevation on the line A—C of Fig. 1, and

Fig. 3 is an enlarged detail of the die box as seen in Fig. 1.

In the drawings, a hopper **10**, disposed above a pair of rollers **11**, **11**, has a removable division plate **12**, having handles **12***a*, which extends from the die box **16** to the top of the hopper **10**, the rollers **11**, **11** being on either side of the plate **12**. With the plate in position, the plastic contents of the sections **10***a* and **10***b* can be different.

Each section **10***a* and **10***b* will have its own pressure chamber consisting of a roll **11**, the plate **12**, part of the die box **16**, and the side plates **13**, which side plates are fastened to a frame **14** by means of wing nuts **14***a*. The side plates **13** are horizontally adjustable and maintained in intimate contact with the end surfaces of the rollers **11** by means of forcing screws **15**. A die box **16**, fastened solely to the side plates **13** by means of bolts **17**, has apertures **16***a*, **16***b*, the former disposed around the latter. The former communicates with the compression chamber associated with the section **10***a* containing dough, and the latter communicates with the compression chamber associated with the section **10***b*, containing fig filling. Adjustably attached to the die box sides **16***c* are plates **16***d*, the upper edges of which are bevelled tangential thereto on lines parallel to the direction of adjustment of the rollers **11**, and have as their object to adjust the space for material passing between themselves and the rollers while permitting the adjustment of the rollers **11**, **11** relative to the division plate **12** or to one another, as the case may be (as may be seen with reference to Fig. 3, which shows the roller **11** in alternative position).

The plates **16***d* are arranged across the width of the compression chamber and are secured thereto by the screws **16***e*. To adjust the plates relative to the rollers **11**, **11**, use is made of eccentrics **16***f*, engaging in slots **16***g* in the plates **16***d*. The eccentrics **16***f* are eccentric to a pin **16***h* carried in the sides **16***c* and turnable therein, this turning moving the plates **16***d* relative to the rollers and thereby allowing a roller to take material, according to the setting of the plates **16***d*, from the compression chamber back to the hopper. The rollers **11** are carried on shafts **11***a*, mounted on ball bearing assemblies **18**, carried on slide blocks **19**. The slide blocks are mounted on guides on the frame **14**, and are adjustable by means of devices of known type, generally denoted **20**, to vary the distance between each roller **11** and the division plate **12** (e. g. to the position shown in broken lines in Fig. 3). Driving means **11***b* are mounted on the shafts **11***a*.

The die box **16** may be readily removed and replaced. A die box having one or more apertures may be employed and the division plate **12** removed to provide a rout machine having a single hopper and a single compression chamber with two opposite feed rollers. This die box may have the plates **16***d* on one side only or on both sides, according to circumstances.

The machine may be readily dismantled and assembled for the purpose of cleaning and maintenance. The division plate **12**, hopper **10**, die box **16** and side plates **13** are readily removable to expose the rollers. These parts may be handled manually without the necessity of lifting tackle, and the cleaning and maintenance operation should not require the services of a skilled engineer, and the time taken to accomplish would be relatively small.

I claim:

1. In a machine for extruding plastic material such

as dough, wherein the material is fed to a compression chamber and exudes therefrom through a die, the combination of a machine frame, at least one roller bounding said compression chamber and supported rotatably at each end by shafts journalled in sides of the machine frame, side plates bounding said compression chamber in a lateral direction and mounted interposed between said sides of the machine frame and the end faces of said roller in intimate surface contact with said end faces, said side plates having peripheral edges defining recesses within which said shafts are located respectively, whereby said side plates are removable from the machine without separation of said shafts from said sides of the machine frame, and a die box bounding said compression chamber and secured solely to said side plates.

2. In a machine for extruding plastic material such as dough, wherein the material is fed to a compression chamber and exudes therefrom through a die, the combination of a machine frame, two spaced rollers bounding said compression chamber and providing an entry gap therebetween for admission of material to said compression chamber, shafts at each end of said rollers journalled in sides of the machine frame, side plates bounding said compression chamber in a lateral direction and mounted interposed respectively between said sides of the machine frame and the end faces of said rollers in intimate surface contact with said end faces, the peripheral edges of said side plates being located clear of said shafts, whereby said side plates are removable from the machine without separation of said shafts from said sides of the machine frame, a die box bounding said compression chamber and secured solely to side side plates and a hopper disposed above said entry gap and detachably supported solely on said side plates.

3. In a machine for extruding plastic material such as dough, wherein the material is fed to a compression chamber and exudes therefrom through a die, the combination of a machine frame, at least one roller bounding said compression chamber and supported rotatably at each end by shafts journalled in sides of the machine frame, side plates bounding said compression chamber in a lateral direction and mounted interposed between said sides of the machine frame and the end faces of said roller in intimate surface contact with said end faces, said side plates having peripheral edges defining recesses within which said shafts are located respectively, whereby said side plates are removable from the machine without separation of said shafts from said sides of the machine frame, a die box bounding said compression chamber and secured solely to said side plates, a plate member extending axially of said roller over the length thereof and secured to said die box for adjustment relative to the peripheral surface of said roller whereby to enable a sheet of material conforming in thickness substantially to the clearance between said plate member and the peripheral surface of said roller to be withdrawn from said compression chamber as said roller rotates, thereby relieving the pressure of material in said compression chamber.

4. In a machine for extruding plastic material such as dough, wherein the material is fed to a compression chamber and exudes therefrom through a die, the combination of a machine frame, at least one roller bounding said compression chamber and supported rotatably at each end by shafts journalled in sides of the machine frame, side plates bounding said compression chamber in a lateral direction and mounted interposed between said sides of the machine frame and the end faces of said roller in intimate surface contact with said end faces, said side plates having peripheral edges defining recesses within which said shafts are located respectively, whereby said side plates are removable from the machine without separation of said shafts from said sides of the machine frame, a die box bounding said compression chamber and secured solely to said side plates, a plurality of juxtaposed plate members extending in the axial direction of said roller over the length thereof and each secured to said die box for independent adjustment relative to the peripheral surface of said roller whereby to enable material to be withdrawn from said compression chamber through clearance between said plate members and the peripheral surface of the roller, thereby relieving the pressure of material in said compression chamber.

5. In a machine for extruding plastic material such as dough, wherein the material is fed to a compression chamber and exudes therefrom through a die, the combination of a machine frame, two spaced rollers bounding said compression chamber and providing an entry gap therebetween for admission of material to said compression chamber, shafts at each end of said rollers journalled in sides of the machine frame, side plates bounding said compression chamber in a lateral direction and mounted interposed respectively between said sides of the machine frame and the end faces of said rollers in intimate surface contact with said end faces, the peripheral edges of said side plates being located clear of said shafts, whereby said side plates are removable from the machine without separation of said shafts from said sides of the machine frame, a die box bounding said compression chamber and secured solely to said side plates, a hopper disposed above said entry gap and detachably supported solely on said side plates, a plurality of juxtaposed plate members associated with each of said rollers extending in the axial direction and over the length thereof, each of said plate members being secured to said die box for independent adjustment relative to the peripheral surface of the associated roller whereby to enable material to be withdrawn from said compression chamber through clearance between said plate members and the peripheral surface of the roller associated therewith, thereby relieving the pressure of material in said compression chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

443,862	Mitchell	Dec. 30, 1890
997,554	Holmes	July 11, 1911
2,340,501	Aasted	Feb. 1, 1944

FOREIGN PATENTS

417,852	Great Britain	Oct. 15, 1934