

Feb. 16, 1965

L. M. H. K. DE LAUBAREDE

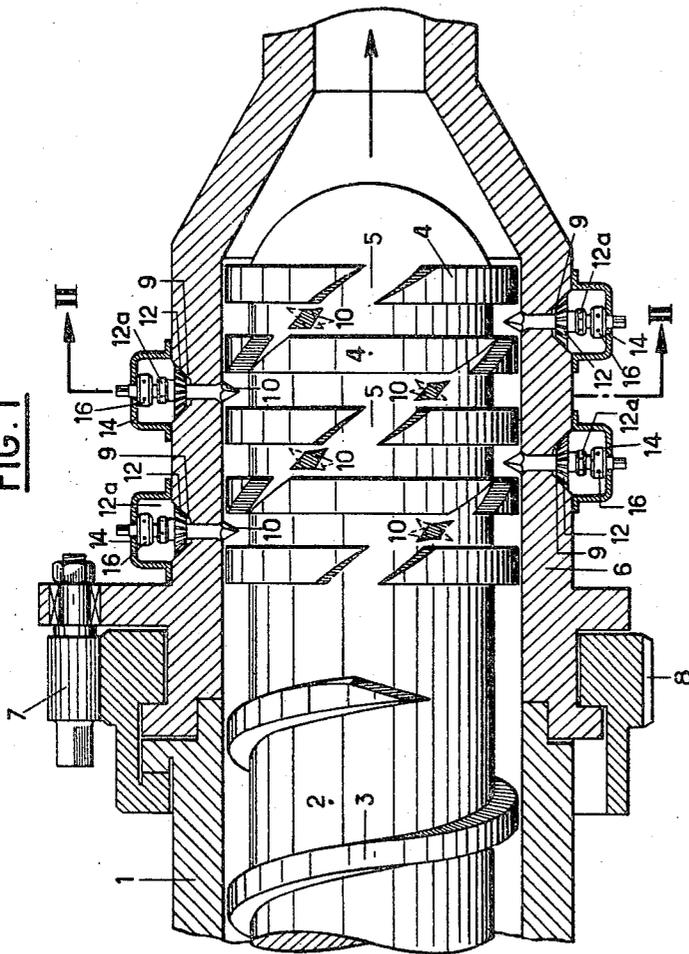
3,169,752

HOMOGENIZING DEVICE FOR EXTRUDING OR INJECTING  
MACHINES IN THE TREATMENT OF THERMOPLASTICS

Filed Aug. 21, 1961

3 Sheets-Sheet 1

FIG. 1



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FIG. 2

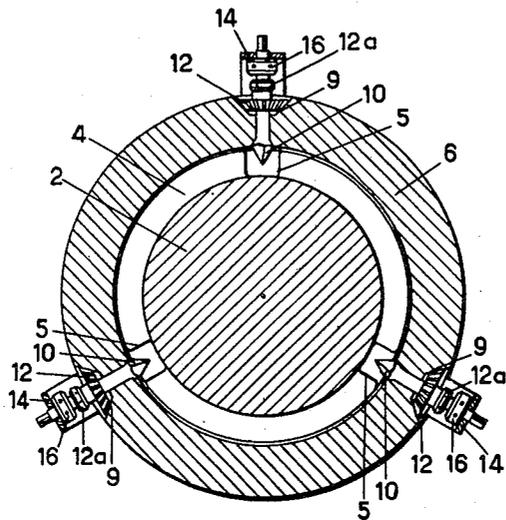
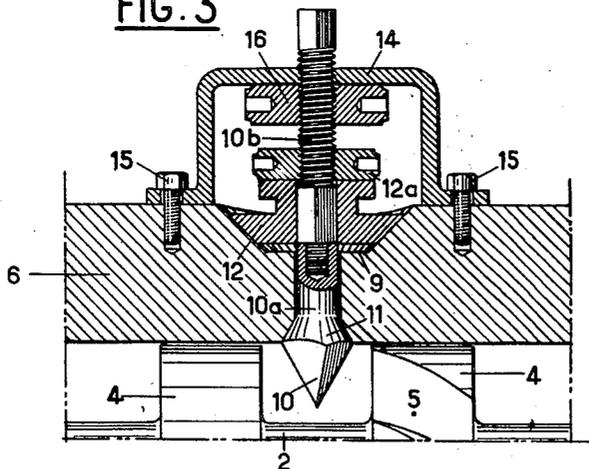


FIG. 3



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FIG. 4

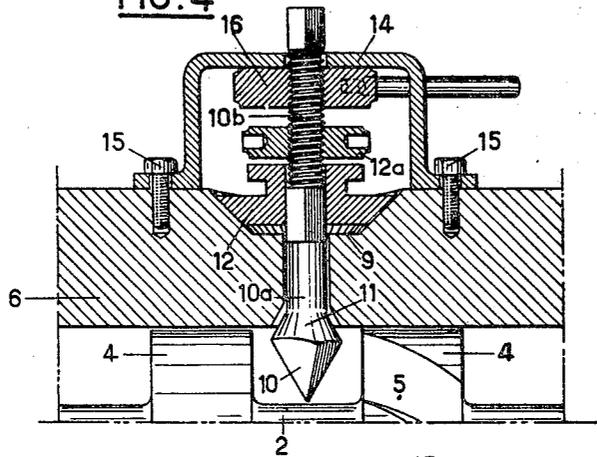
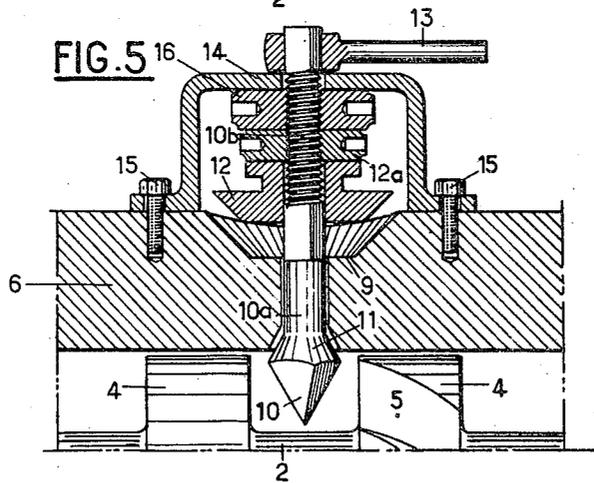


FIG. 5



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**HOMOGENIZING DEVICE FOR EXTRUDING OR INJECTING MACHINES IN THE TREATMENT OF THERMOPLASTICS**

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 Claims priority, application France, Aug. 22, 1960, 836,444

6 Claims. (Cl. 259-7)

The present invention has for its object a homogenizing device adapted to be interposed in any suitable location in the path followed by the material in an extruding or injecting machine.

Said device is essentially characterized by the fact that the same may be adjusted to adapt itself to homogenize masses having different viscosities without it being necessary, as been the common practice in the past, to change the combs, the teeth of which extended into circular grooves in a rotating member of the type described in U.S. Patent No. 2,631,016.

In order to insure such an adjustment, the combs previously used are replaced by adjustable rotatable knives or plows, which are mounted upon a housing and enter helical grooves provided in the circular ribs of the rotating member which rotates within said housing.

In order to insure fluid tightness despite the large pressures which are developed within the housing, the knives comprise at the lower part thereof a base in the shape of a truncated cone, which base ends in a point or in a flat part forming a knife, said base bearing upon a corresponding seat on the housing internal wall, having a complementary shape.

In the preferred form of this invention, the knives which extend into the interior of the housing are provided at the end which protrudes outside of the housing with an internally threaded socket which receives a mating externally threaded rod which comprises a square cross-sectional part, a ring being slidably mounted thereon, which is provided with teeth inclined to the axis thereof and adapted to engage corresponding notches made in a coaxial cup provided on the aforementioned housing.

Owing to the presence of said ring, the knife can be rotated only by sliding the ring outwardly on the rod until its teeth clear the notches in the wall of the cup, after which locking of the knife in the adjusted position is insured by reengagement of the ring with the housing.

In the preferred form of this invention, there is positioned, between each circular rib of said rotating member, a knife adapted to be turned at will.

In order that this invention may be completely understood, there is shown in the annexed drawings in an illustrative and by no means limitative way a preferred form of this invention.

In the drawings:

FIG. 1 is an axial sectional view through a homogenizing device comprising a single rotating member, provided with helical grooves in circular ribs, rotating within a housing in which are mounted the adjustable swivelling knives characteristic of this invention;

FIG. 2 is a sectional view along the line II-II in FIG. 1;

FIG. 3 is an enlarged section of an adjustable knife and the control device thereof;

FIG. 4 shows said knife in the course of being disengaged prior to the adjustment, and,

FIG. 5 shows the same knife in the course of being adjusted.

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Referring to FIG. 1, it can be seen that the device embodying this invention comprises essentially a rotating member 2, which rotates within a case or housing 1 and is provided with a helical rib 3 and circular ribs 4 at the end thereof. Said ribs 4 have three helical grooves 5 through which the thermoplastic material is caused to flow when said member 2 rotates within housing 1.

It is to be noted that the housing 1 is provided at its outlet end with an extension 6 forming a sleeve, which is coaxial with housing 1 to which it is attached by means of a bayonet joint through a pinion gear 7 meshing with a ring gear 8. On said sleeve 6 are formed the recesses 9 for the knives 10 which are disposed between circular ribs 4 and in alignment with said helical grooves 5, four grooves being provided in the described form of this invention.

Said knives, which work on the flow of the thermoplastic mass which is constrained to pass through helical grooves 5, are adapted to be axially rotated by means of a control which is more particularly visible in FIGS. 3, 4 and 5.

Each knife 10 is made in two parts. The inside part 10a forming the knife itself comprises a base 11 in the shape of a truncated cone which terminates in a point having a quadrangular section or thinner part forming a cutting blade which penetrates into the helical groove without engaging the bottom of the latter. Said base is adapted to bear against the seat in the internal surface of sleeve 6, so that fluid tightness can be insured despite the large pressures which are developed during the operation of the apparatus.

The other part 10b of the knife is screw-threaded into said part 10a and said part 10b comprises a body having an externally threaded portion between an upper part and a lower part having both a square section.

On the lower part having a square section is mounted a ring 12, having preferably a cross-section in the shape of a truncated cone provided with external teeth adapted to mesh with corresponding notches in the recess 9 of sleeve 6.

Said ring 12 is maintained engaged in said recess 9 by a nut 12a mounted on the screw-threaded body 10b of knife 10.

An operating arm 13 (see FIG. 5) is adapted to be fixed on the upper square cross-sectional part of the knife.

As can be seen in FIG. 3, each knife is locked in position by a retaining lug 14 fixed to sleeve 6 by bolts 15.

Before making the adjustment, it is necessary to disengage the knife base 11 from the corresponding seat in sleeve 6 and to do this it is necessary to act upon nut 12a by elevating the latter along the threaded part of knife 10 as it is seen in FIG. 4, so that afterwards, it is possible to lower slightly said knife by manipulating a nut 16 which engages the lower face of the retaining lug 14.

Once base 11 is disengaged from the seat thereof, the operator must adjust the orientation of the knife, by elevating the ring 12, such elevation being made possible by the previous elevation of nuts 12a and by disengaging the external teeth of said ring from the corresponding notches in sleeve 6, as it is seen in FIG. 5.

Once the disengagement of ring 12 from sleeve 6 is effected by sliding said ring upon the lower plain square section of knife 10, such knife may be rotated on its axis by acting upon the control bar 13 so as to move the knife by one or more teeth, and then once the adjustment is completed, the latter is locked by lowering the ring 12 along the lower square section part and by causing the teeth thereof, in its new adjusted position, to engage the corresponding notches of recess 9, locking of ring 12 in the adjusted position being insured by nut 12a. At the com-

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pletion of the operation, it is sufficient to manipulate nut 12a in order to bring again the recited base 11 against the seat thereof.

In order to locate the adjustment, a disc (not shown) can be provided on the fixing lug 14 of each knife, said disc bearing indicia over which moves an index engraved on the upper part of the knife.

It is clear that the number of helical grooves may be modified, and thus that of the knives, within the scope of the present invention as defined in the appended claims.

What I claim is:

1. In a device for homogenizing plastic material comprising an internally cylindrical casing, and an elongated member mounted axially of said casing for rotation there-  
within, said elongated member being provided with a plurality of parallel annular ribs brushing the internal wall of said casing, and said ribs being interrupted by heli-  
cally aligned passageways extending therethrough the im-  
provement which comprises flow regulating means posi-  
tioned between said ribs in helical alignment with said  
passageways, and means extending through said casing  
for adjusting the position of said flow regulating means.

2. A device as claimed in claim 1 in which said flow  
regulating means are rotatably mounted vanes having a  
greater width in one direction transverse to the axes of  
their supporting means than in another such transverse  
direction.

3. A device as claimed in claim 2 comprising releasable  
means for locking said vanes in any one of a plurality of  
predetermined fixed positions.

4. A device as claimed in claim 3 in which said releas-

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able locking means comprises an externally toothed ring  
keyed to said rotatable adjusting means, and axially slid-  
able therealong, a socket on the wall of said casing posi-  
tioned to receive said ring, and notches on the internal  
wall of said socket dimensioned to mesh with the teeth  
on said ring.

5. A device as claimed in claim 1 in which said elon-  
gated member is also provided with a helical rib axially  
spaced from said circular ribs toward the inlet end of said  
casing.

6. In a device for homogenizing plastic material, said  
device comprising an internally cylindrical casing and an  
elongated member mounted axially of said casing for ro-  
tation therewithin, said elongated member being provided  
with a plurality of parallel annular ribs which brush the  
internal wall of said casing, and said ribs being interrupted  
by passageways extending therethrough, the improvement  
which comprises flow regulating means positioned be-  
tween said rings, and rotatable means extending through  
the wall of said casing for supporting and adjusting the  
position of said flow regulating means.

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WALTER A. SCHEEL, *Primary Examiner.*

LEO QUACKENBUSH, *Examiner.*