United States Patent [19]

Fischer

[11] **3,801,248**

[45] **Apr. 2, 1974**

[54] **COMPRESSION ASSEMBLY FOR SOAP PLODDER**

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[73] Assignee: **Colgate-Palmolive Company**, New York, N.Y.

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[52] **U.S. Cl.** **425/199**, 252/371, 264/148, 425/309

[51] **Int. Cl.** **C11d 13/18**

[58] **Field of Search** ..... 425/197, 198, 199, 313, 425/464, DIG. 37, 309; 264/349, 148; 252/367, 371

[56] **References Cited**

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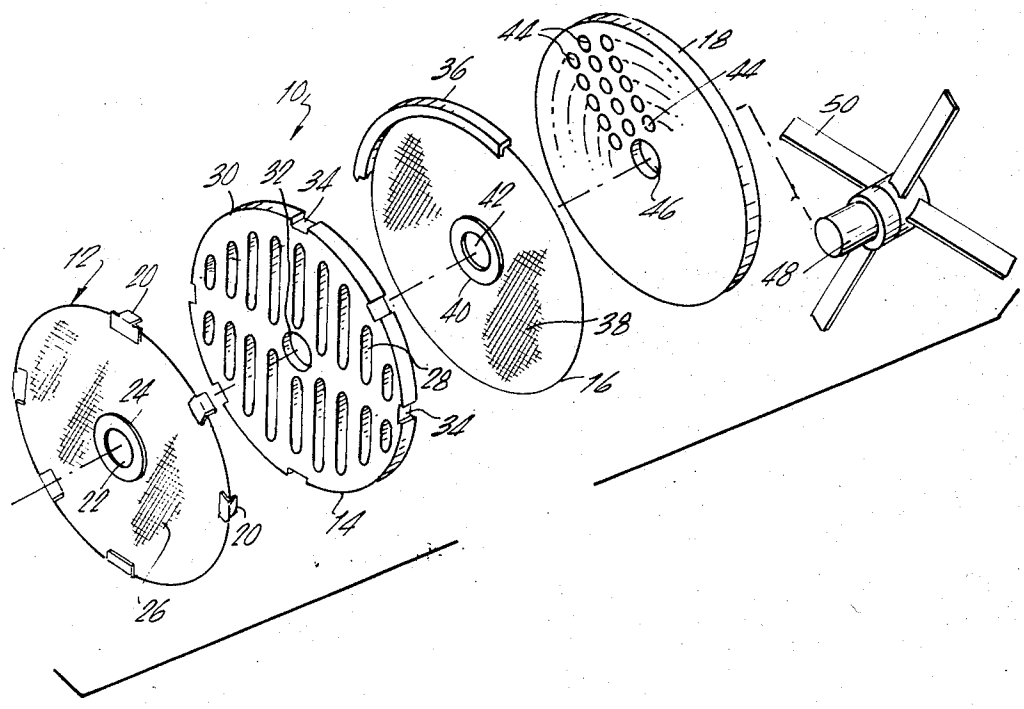
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3,028,627	4/1962	McCormick	425/199 X
3,584,355	6/1971	Fischer	425/199

Primary Examiner—R. Spencer Annear
Assistant Examiner—Mark Rosenbaum
Attorney, Agent, or Firm—Herbert S. Sylvester, Esq.; Murray M. Grill, Esq.; Kenneth A. Koch, Esq.

[57] **ABSTRACT**

A compression assembly for a soap plodder having a housing, rotating means in the housing for levigating and homogenizing a mass of soap and including a shank having flights including an end flight disposed thereon. The compression assembly is located adjacent to the end flight and includes a first perforate means, a first compression plate having a plurality of elongated slots therein, a second perforate means contiguous to the first compression plate means, and a second compression plate whose structure defines a plurality of apertures located adjacent the second perforate means and closely spaced thereto for preventing blockage of the second perforate means by accumulated soap under the rotating means.

9 Claims, 6 Drawing Figures



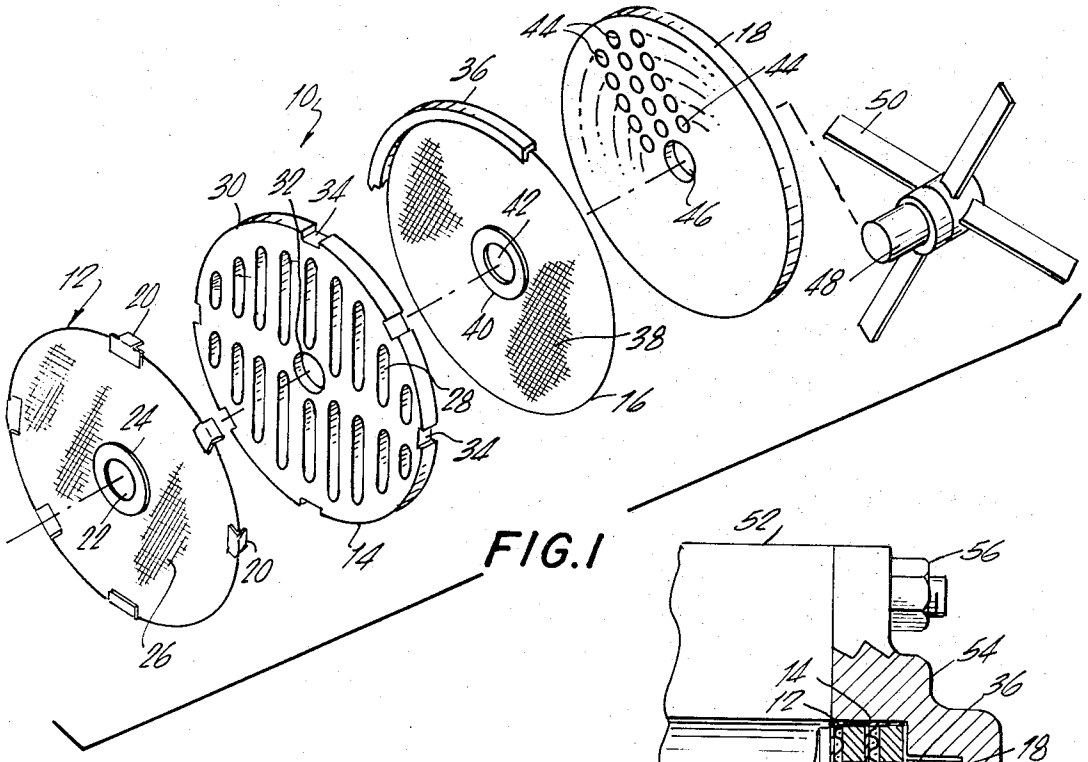


FIG. 1

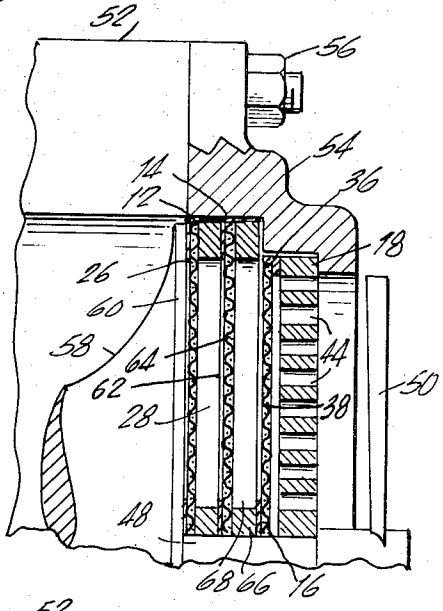


FIG. 3

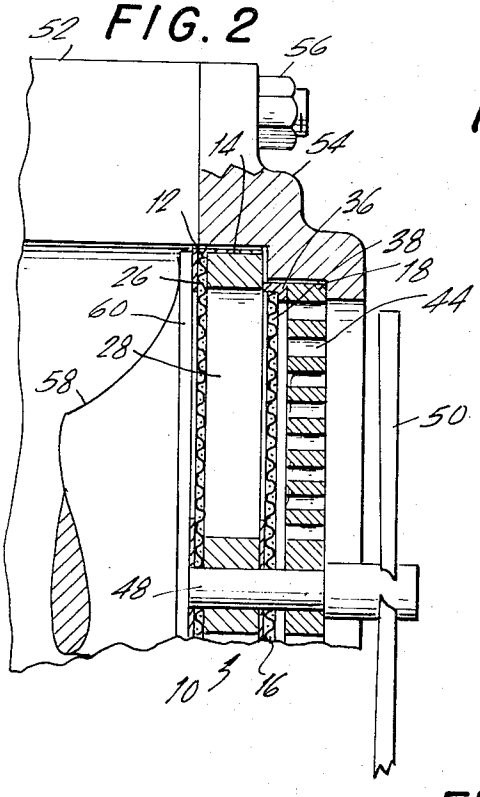


FIG. 2

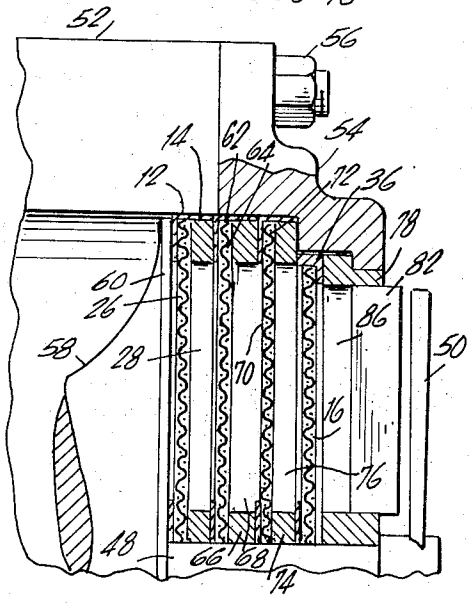


FIG. 4

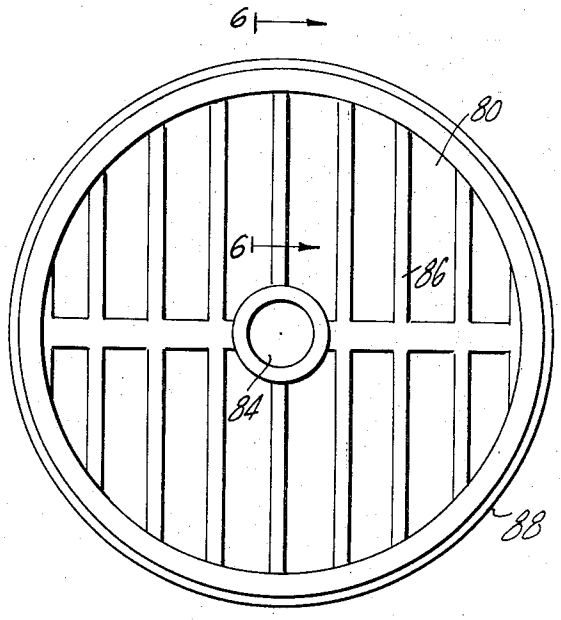


FIG. 5

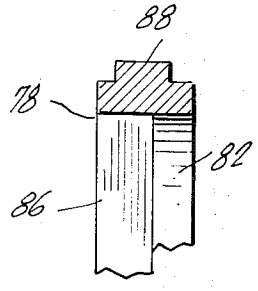


FIG. 6

COMPRESSION ASSEMBLY FOR SOAP PLODDER

BACKGROUND OF THE INVENTION

This invention relates to a novel compression assembly for a soap plodder. More particularly, this invention provides a novel compression assembly which replaces the conventional compression assembly in a soap plodder and produces a higher quality soap more efficiently.

The plodding of soap is a well known manufacturing process and was extensively discussed in U.S. Pat. No. 3,584,355 which issued June 15, 1971 to Charles F. Fischer and will be incorporated by reference. The invention in this patent provided a compression assembly for use in a soap plodder including rotating means in a housing for levigating and homogenizing a soap, the rotating means including a shank having flights and end flight means disposed thereon. The compression assembly for the soap plodder in U.S. Pat. No. 3,584,355 comprised a first compression plate means having a plurality of bores extending therethrough for partially plasticizing the soap, perforate means located adjacent the first compression plate means and closely spaced thereto for forcing the partially plasticized soap therethrough, and second compression plate means having elongated slots therein and located adjacent and closely spaced to the perforate means for preventing blockage of the perforate means by accumulated soap during processing of the soap under pressure. This compression assembly provided for the prevention of the blockage of the perforate means by the mass of soap processed therein, and substantially increased the speed at which the soap could be processed over that which was previously attainable. However, since the issuance of U.S. Pat. No. 3,584,355, it has been found that by switching the compression plate means having a plurality of bores extending therethrough with the compression plate means having elongated slots therein, and adding another perforate means, preferably a 10 or 18 mesh screen, adjacent the end flight means disposed on the end of a shank which levigates and homogenizes a mass of soap, in all cases has contributed to a higher quality of soap with enhanced appearance for aesthetic purposes, with improved hardness, toughness and minimal cracking properties; and can be mechanical refined even more efficiently than with the compression assembly disclosed in U.S. Pat. No. 3,584,355.

SUMMARY OF THE INVENTION

It is therefore, the primary object of this invention to provide a compression assembly for use in soap plodders which substantially increases the speed at which the soap can be processed thereby over that which was previously attainable.

It is another object of this invention to provide a compression assembly for use in soap plodders, which not only will prevent blockage of the screen by the mass of soap being processed therein, but will additionally provide for the production of a soap with enhanced appearance possessing minimal cracking properties.

Broadly, this invention accomplishes all of the foregoing objects by providing a compression assembly for a housing, and rotating means in the housing for levigating and homogenizing a mass of soap. The rotating means include a shank having flights and end flight means disposed thereon. The compression assembly is located adjacent the end flight means for permitting uniform plasticizing of the soap and comprises a first perforate means (preferably a 10 or 18 mesh heavy duty screen) for having the soap forced therethrough, a first compression plate having a plurality of slots therein for partially plasticizing the soap and situated adjacent the first perforate means and closely spaced thereto for preventing blockage of the first perforate means by accumulated soap during processing of the soap under pressure from the rotating means. A second compression plate having a structure defining a plurality of apertures is also provided adjacent the second perforate means and closely spaced thereto for further plasticizing said soap and for preventing blockage of the second perforate means by accumulated soap during processing of the soap under pressure from the rotating means.

Still further objects and features of the invention reside in the provision of a compression assembly for use in a soap plodding apparatus, which assembly may economically be installed and plasticizes a soap product having uniform particle distribution and possessing a higher quality over that which was previously attained.

These, together with the various ancillary objects and features of this invention, which will become apparent as the following description proceeds, are attained by this compression assembly, a preferred embodiment of which has been illustrated in the accompanying drawing, by way of example only, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of the compression plate assembly and the cut-off knife to be used in a soap plodder constructed in accordance with the concepts of the present invention;

FIG. 2 is a vertical sectional view showing the manner in which the compression plate assembly of the invention is mounted in a compression assembly housing in a soap plodder;

FIG. 3 is a vertical sectional view of another embodiment of the compression plate assembly including an additional screen and compression plate mounted in a similar compression assembly housing of FIG. 2;

FIG. 4 is a vertical sectional view of still another embodiment of the compression plate assembly including two additional screens and compression plates with a slotted plate mounted in a similar compression assembly housing of FIG. 2;

FIG. 5 is an elevational view of an additional modification of the invention including a slotted plate; and

FIG. 6 is a vertical sectional detail view of the slotted plate looking along the plane of line 6-6 in FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

With continuing reference to the accompanying drawings, particularly with reference to the embodiment shown in FIGS. 1 and 2, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate a compression assembly for use in a soap plodder including assembly housing 54 connected to plodder housing 52 by nut and bolt 56. An eccentric shank 58 having worm flights thereon is rotatably mounted in housing 52. The worm flights have a graduated flight pitch, and the end flight 60 in abutting and wiping

contact with the entire surface of a perforate plate **12** of the compression assembly **10.** Compression assembly **10** additionally includes a compression plate **14,** a perforate plate **16,** and a heavy duty compression plate **18.** The perforate plate **12** includes a heavy duty mesh screen **26** of 0.03 inch, wire having a plurality of rectangular plate lugs **20** attached thereto, and rim **24** having a large central bore **22.**

Compression plate **14** is provided with parallel elongated and substantially rectangular shaped slots **28** extending between its front face **30** and the rear a face spaced about a large central bore **32.** Compression plate **14** additionally includes a plurality of substantially U-shaped channeled grooves **34** wherein lugs **20** lodge.

The perforate plate **16** includes a thick metal rim **36,** a heavy duty mesh screen **38** of 0.03 inch wire rigidly mounted therein and a rim **40** having a large central bore **42.** Compression plate **18** has a plurality of radially spaced tubular apertures or tapered bores **44** extending therethrough with a large central bore **46.** Perforate plate **12** and a compression plate **14** generally include a diametrical measurement approximately the same, and the perforate plate **16** and compression plate **18** also generally include a diametric measurement approximately the same but less than perforate plate **12** and compression plate **14.** When perforate plate **12,** compression plate **14,** perforate plate **16,** and compression plate **18** are assembled for use, the compression assembly **10** is mounted in the plodder by being rotatably mounted over the shaft end **48** within plodder housing **52.** The worm **58** carries soap forward introduced therein from a hopper (not shown) and subjects it to levigation and homogenization. The soap is forced first through perforate means **12,** subsequently through compression plate **14** which partially plasticizes the soap and prevents blockage of perforate plate **12,** perforate plate **16,** and through compression plate **18** which further plasticizes the soap and prevents blockage of perforate plate **16** by accumulated soap during processing of the soap under pressure. Behind compression plate **16** is a cutting means in the form of a knife **50,** preferably a cut-off knife which rotates with shaft **48** integrally bounded to shanks **58** and shears soap passing through compression plate **18,** or the like.

FIG. **3** discloses another embodiment of the invention additionally including between compression plate **14** and perforate plate **16,** perforate plate **62** having heavy duty mesh screen **64** for having partially plasticized soap forced therethrough, and compression plate **66** including a plurality of elongated slots **68** for further partially plasticizing soap. Perforate plate **62** and compression plate **66** are approximately the same diameter as compression plate **14.**

FIG. **4** shows yet another embodiment of the invention additionally including between compression plate **66** and perforate plate **16,** perforate plate **70** having a heavy duty screen **72** for having partially plasticized soap forced therethrough, and compression plate **74** including a plurality of elongated slots **76** for further plasticizing the soap. Perforate means **70** and compression plate **74** have approximately the same diameter as compression plate **66.** In this embodiment of the invention compression plate **18** is replaced by the slotted plate **78** as shown in FIG. **5** and has structure including a plurality of substantially rectangular shaped openings **80** parallel to each other and defining a plurality of parallel spaced ribs **86** secured to a periphery **88** and recessed as at **82** therein. Large central bore **84** is also defined by slotted plate **78.** It is particularly desirable to utilize this embodiment of the invention when soap back-up pressure is to be reduced. Slotted plate **78** may also replace either compression plate **14, 66** or **74** having its recessed portion **82** on the downstream side with respect to soap movement for increasing colloidal and shearing action on the downstream side depending on the amount of compression employed against compression assembly **10.**

While the present invention has been described in reference to the drawings, it will be apparent that permissible modifications, latitude, and variations can be employed without departing from the spirit of the invention as defined by the scope of the appended claims.

We claim:

1. A compression assembly for use in a soap plodder including a housing, rotating worm means in said housing and having an end flight for levigating and homogenizing a mass of soap, said compression assembly being located adjacent said end flight for permitting uniform plasticizing of soap, said compression assembly comprising a first perforate plate for having said soap forced therethrough, a first compression plate having a plurality of slots therein for partially plasticizing said soap and situated adjacent said first perforate plate and closely spaced thereto for preventing blockage of said first perforate plate by accumulated soap under pressure from said rotating worm means, a second perforate plate contiguous to said first compression plate and closely spaced thereto for forcing said partially plasticized soap therethrough, a second compression plate having a plurality of apertures and located adjacent said second perforate plate and closely spaced thereto for further plasticizing said soap and for preventing blockage of said second perforate plate by accumulated soap during processing of said soap under pressure from said rotating worm means.

2. The compression assembly of claim **1,** wherein said first perforate plate includes a plurality of rectangular plate lugs attached to the periphery thereof, said first compression plate having a plurality of elongated slots and having a plurality of channeled grooves wherein said rectangular plate lugs lodge.

3. The compression assembly of claim **1,** wherein said second perforate plate includes a circular metal rim having a circular screen rigidly mounted therein, said apertures being evenly radially spaced concentric with the center of said second compression plate.

4. The compression assembly of claim **1,** wherein said plurality of apertures of said second compression plate is formed by a plurality of parallel spaced ribs secured to a periphery of said second compression plate and recessed therein to define a plurality of substantially rectangular shaped openings parallel to each other.

5. The compression assembly of claim **1,** wherein said end flight is in abutting and wiping contact with the entire surface of said first perforate plate for forcing soap through said compression assembly.

6. The compression assembly according to claim **1,** wherein said rotating worm means rotatably extends through said compression plate assembly.

7. The compression assembly according to claim **1,** including knife means connected to said rotating worm

means and rotatable therewith, said knife means being situated adjacent said second compression plate for shearing soap passing through said second compression plate.

8. The compression assembly of claim **1**, additionally including in order stated between said first compression plate and said second perforate plate a third perforate plate for having said partially plasticized soap forced therethrough and a third compression plate having a plurality of elongated slots, and third perforate plate and said third compression plate having approximately the same diameter as said first compression plate.

9. The compresssion assembly of claim **8**, additionally including in order stated between said third compression plate and said second perforate plate a fourth perforate plate for having said partially plasticized soap forced therethrough and a fourth compression plate including plurality of elongated slots, said fourth perforate plate and said fourth compression plate having approximately the same diameter as said third compression plate, said second compression plate is formed by a plurality of parallel spaced ribs secured to a periphery of said second compression plate and recessed therein to define a plurality of substantially rectangular shaped openings parallel to each other.

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