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[54] **PUMP HAVING ROTOR WITH TRANSVERSE FEED AND DISCHARGE**

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[52] **U.S. Cl.** **417/203**, 417/205, 417/900, 418/195

[51] **Int. Cl.**.....**F04b 23/14**

[58] **Field of Search**.....417/201, 203, 205, 900; 418/195

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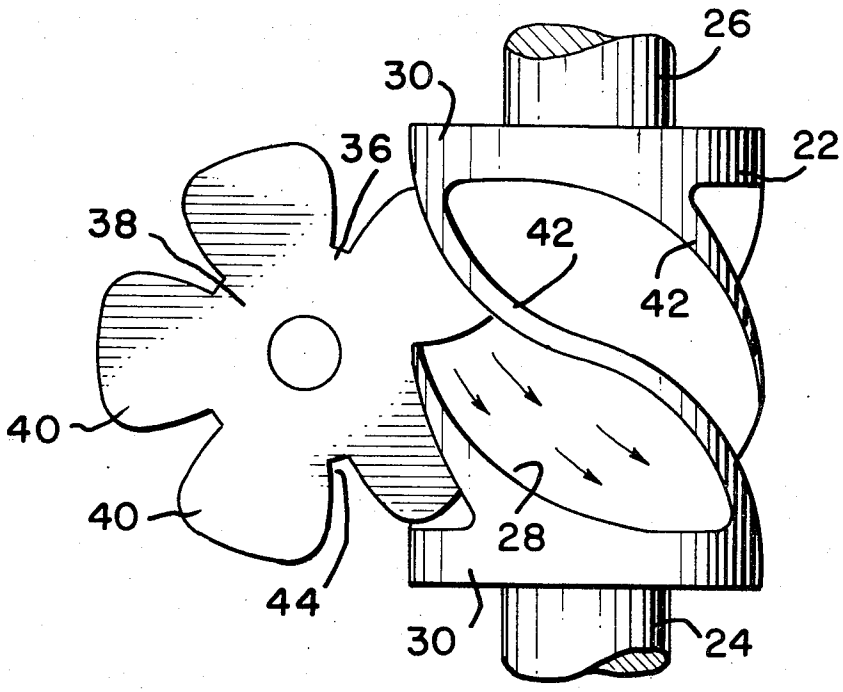
[57] **ABSTRACT**

A pump comprising a rotor rotatably driven about a longitudinal axis and including peripheral rotor pockets which each longitudinally extend generally spirally around only a portion of the periphery of the rotor and have their ends inwardly of the ends of the rotor. A disc, rotatably driven in timed relationship with the driven rotation of the rotor about an axis transverse to said rotor axis, is provided with peripheral lobes sealingly in the rotor pockets for discharging material from the pockets in a direction transverse to said rotor axis as the material is rotated in the rotor pockets towards the disc. Material to be pumped is supplied to the rotor pockets on one side of the disc in a direction transverse to the rotor axis, whereupon the driven rotation of the rotor moves the material to the other side of the disc where it is discharged from the rotor pockets by the disc.

35 Claims, 7 Drawing Figures



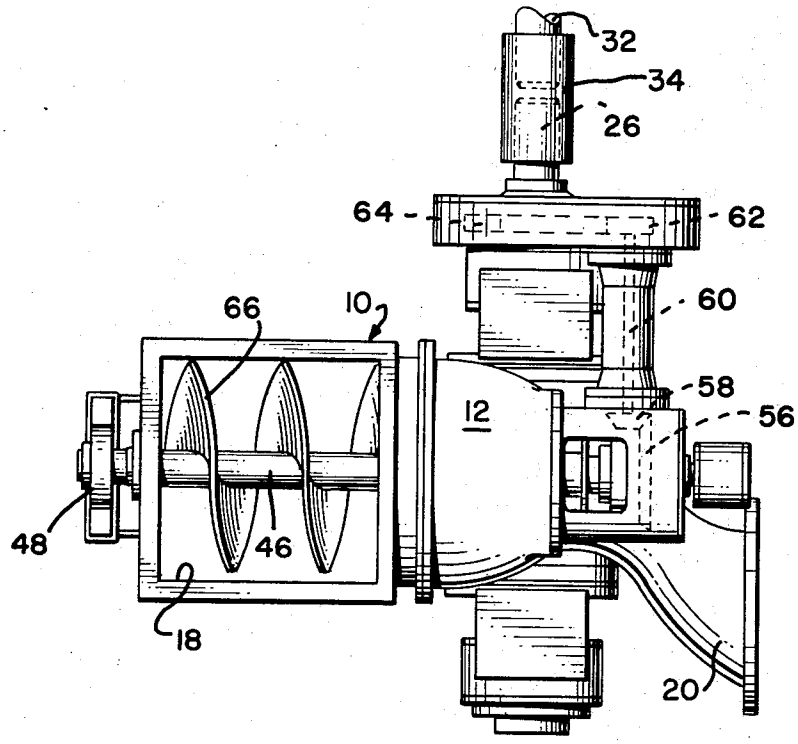


FIG. 1

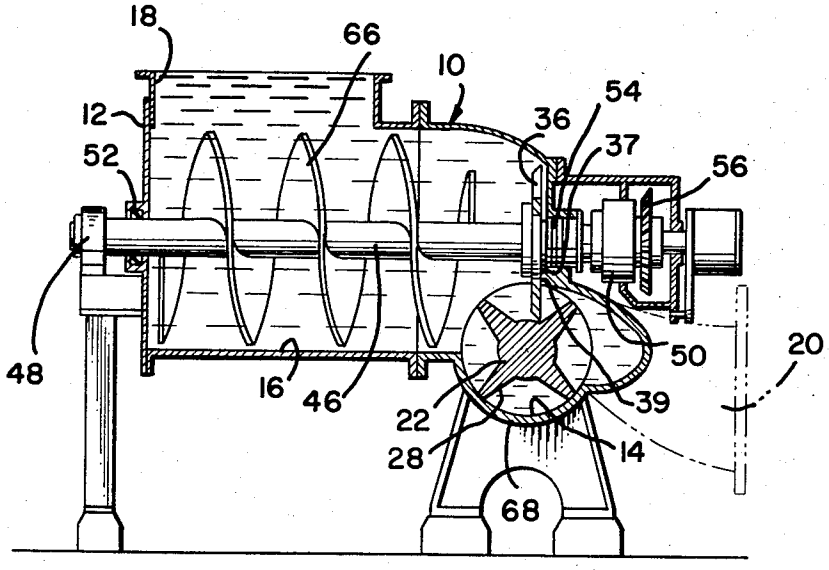


FIG. 2

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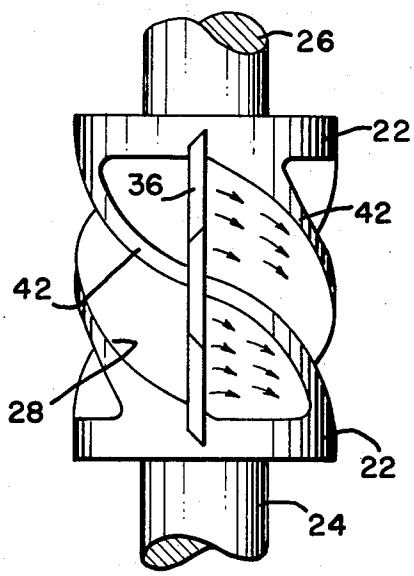

FIG. 3

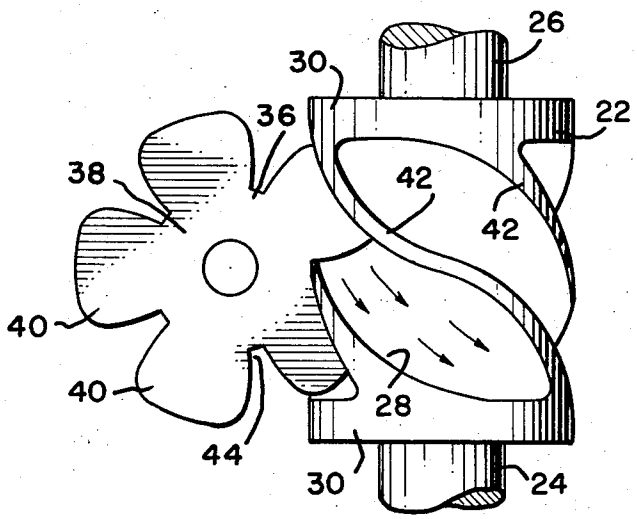

FIG. 4

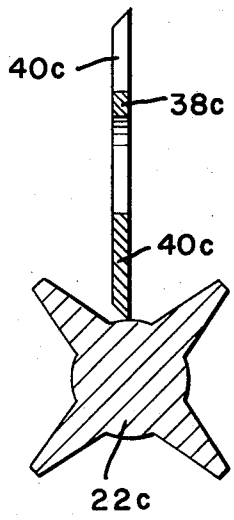

FIG. 7

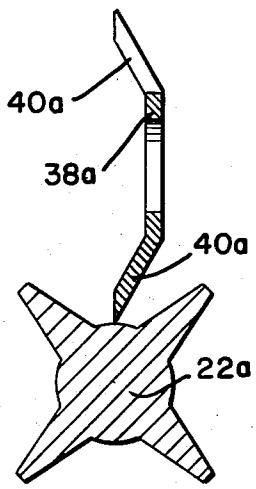

FIG. 5

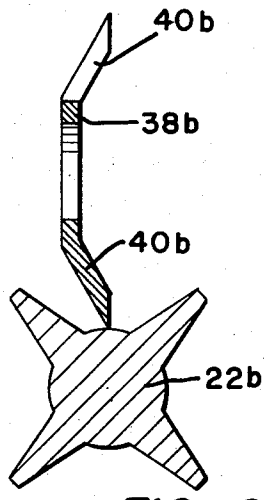

FIG. 6

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PUMP HAVING ROTOR WITH TRANSVERSE FEED AND DISCHARGE

The present invention relates to pumps and more specifically to the provision of a new and improved pump which, although particularly intended for pumping a slurry such as pulp for the manufacture of paper, is suitable for application with liquids and other materials.

Conventionally, pumps employed for pumping a slurry, such as pulp for the manufacture of paper, normally are dependent on a high fluid quality or flowability of the slurry for their successful operation. Generally, moreover, these conventional pumps operate by squeezing or trapping the slurry between a plurality of rotatably driven rotors and thus inherently produce high-pressure surges in the pumped slurry. Also, such prior pumps usually are highly susceptible to substantial damage of the pumping elements by tramp materials in the pumped slurry, have undesirably large through-put variations and/or are undesirable for high-speed operation.

An object of the present invention is to provide a new and improved pump which is particularly constructed and arranged to successfully pump materials of lesser fluid quality or flowability as well as those of high fluid quality or flowability.

Another object of the invention is to provide a new and improved pump which is particularly constructed and arranged for effectively handling tramp materials in the pumped material without resultant substantial damage to the pumping elements.

Another object is to provide a new and improved pump which is particularly constructed and arranged to prevent the aforementioned high pressure surges in the pumped material.

Another object is to provide a new and improved pump which is relatively simple and economical in construction, and particularly adapted for high-speed operation.

Another object is to provide a new and improved pump which, although particularly intended for pumping a slurry such as pulp, is suitable for pumping liquids and other materials.

These objects and other objects and advantages of the invention which will be apparent from the following description taken in connection with the accompanying drawings, are attained by the provision of a pump which in general may comprise housing means, rotor means in the housing means rotatably driven about a longitudinal axis and including peripheral rotor pockets extending generally spirally therearound, such rotor pockets each longitudinally extending around only a portion of the periphery of the rotor means and having their ends inwardly from the ends of the rotor means, disc means in the housing means rotatably mounted about an axis transverse to such axis of the rotor means, such disc means including a plurality of peripheral lobes received in the rotor pockets for discharging material from the rotor pockets in a direction transverse to said axis of the rotor means, supply means for supplying material to be pumped to the rotor pockets on one side of the disc means in a direction transverse to said axis of the rotor means, the driven rotation of the rotor means being in a rotary direction to cause the supplied material to be rotated in the rotor pockets towards the other side of the disc means whereby the material is discharged from the rotor pockets by the disc means adjacent such other side thereof in a direction transverse to said axis of the rotor means, and discharge means for receiving the material discharged from the rotor pockets by the disc means.

Referring to the drawings:

FIG. 1 is a top or plan view of a pump constructed in accordance with one embodiment of the invention;

FIG. 2 is an elevational sectional view of the pump shown in FIG. 1;

FIG. 3 is an enlarged fragmentary top or plan view illustrating the rotor and disc employed in the pump shown in FIGS. 1 and 2;

FIG. 4 is an elevational view of such rotor and disc, looking from the side of the discharge means;

FIG. 5 is a fragmental elevational sectional view illustrating a rotor and disc of a pump constructed in accordance with a modified embodiment of the invention; and

FIGS. 6 and 7 are fragmental elevational sectional views showing rotors and discs of pumps constructed in accordance with two other modified embodiments of the invention.

Referring more particularly to the drawings wherein similar reference characters designate corresponding parts throughout the several views, FIGS. 1 and 2 illustrate a pump designated generally as **10** which, although particularly intended for pumping a pulp slurry employed for the manufacture of paper, may alternatively be utilized for pumping other materials such as, for example, liquids or other liquid-solid mixtures.

The pump **10** comprises a pump housing or casing **12** containing a pumping chamber **14** which, in turn, contains a rotor **22** mounted for rotation about its longitudinal axis by coaxial shafts **24**, **26** projecting from opposite ends of the rotor **22**. The rotor **22** includes a plurality of peripheral rotor pockets or grooves **28** which longitudinally extend generally spirally around the rotor longitudinal axis, the rotor pockets **28** being preferably few in number but not less than three. The rotor pockets **28** each are of relatively large cross-section and at the most each longitudinally extend around only about one-half of the rotor periphery. The rotor pockets **28** each are uninterrupted throughout the major portion of the length of the rotor **22** but, as best shown in FIGS. 3 and 4, are closed adjacent the ends of the rotor **22** by peripheral annular land portions **30** of the latter. The shaft **26** projecting from one end of the rotor **22** is connected to a drive shaft **32** through a coupling sleeve **34**, the drive shaft **32** being, in turn, connected to a suitable conventional drive motor (not shown) to be rotatably driven thereby at the speed of rotation desired for the rotor **22**. The optimum rotary speed of the rotor **22** is, of course, variable with respect to different pumped materials and different pumping requirements; however, by way of example, this rotary speed may if desired be in the range of from 400 to 1,000r.p.m.

The casing **12** contains a supply chamber **16** connected to one side (the left-hand side, as viewed in FIGS. 1 and 2) of the pumping chamber **14** for supplying the material to be pumped to the rotor pockets **28** in a direction transverse to the longitudinal axis of the rotor **22** or radially of the rotor **22**. The connection of

the supply chamber **16** to the pumping chamber **14** extends the full length of the rotor pockets, thereby providing a relatively large inlet for the pumping chamber **14** to ensure satisfactory feed of material to the pockets **28**. The upper end of the housing **12** is provided with a material inlet **18** which communicates with the supply chamber **16**; and during the operation of the pump **10** the material to be pumped is normally continuously supplied to the supply chamber **16** through the inlet **18** by conventional suitable conduits or other feed apparatus (not shown) connected to a source of the material. In this manner, the supply chamber **16** is normally maintained full of the material to be pumped during the operation of the pump **10**.

An outlet or discharge conduit **20** is connected to the opposite side of the pumping chamber **14** from the supply chamber **16** (i.e., the right-hand side, as viewed in FIGS. **1** and **2**) for receiving pumped material from the pumping chamber **14** in a direction transverse to the longitudinal axis of the rotor **22** or radially of the rotor **22**. The outlet **20** during the operation of the pump **10** may be connected to any suitable conventional conduitry (not shown) which is, in turn, connected to direct the pumped material to the desired location.

The pump **10** further includes a disc **36** mounted for rotation about an axis which is transverse to the aforementioned longitudinal axis of the rotor **22** and above the latter axis. The disc axis, as illustrated, is normal or perpendicular to the rotor axis; however, it will be understood that, if desired, the disc axis could be at an angle other than 90° to the rotor axis. The disc **36**, as best shown in FIGS. **2** and **3**, is preferably laterally offset to the right-hand or discharge side of the rotor axis and comprises a central hub-like body portion **38** having disc lobes **40** which project outwardly from its periphery at spaced locations therearound and at their outer ends slidably engage the rotor **22** on the right hand or discharge side of its said axis. The disc lobes **40** are sealingly received in the rotor pockets **28** adjacent the upper side of the rotor **22** with the generally spiral rotor lands **42** intermediate the rotor pockets **28** sealingly received in the spaces **44** between the disc lobes **40**. Thus, the disc **36** seals along its entire periphery adjacent the rotor **22** to provide complete sealing of the rotor pockets **28**.

The disc **36**, as shown in FIG. **4**, effectively prevents substantial flow of material from the supply chamber **16** to the outlet **20** around the upper side of the rotor **22**, and leakage of the material between the disc **36** and the thereadjacent wall **37** is, as shown in FIG. **2**, prevented by therebetween sealing means **39**.

The disc **36** is fixedly mounted on a coaxial shaft **46** which longitudinally extends through the supply chamber **16** and is rotatably mounted adjacent opposite ends by bearings **48**, **50**. Leakage of material from the supply chamber **16** along the shaft **46** is prevented by sealing means or packing **52**, **54** encircling the shaft **46** adjacent opposite sides of the supply chamber **16**. One end of the shaft **46** carries a bevel gear **56** which, as illustrated in FIG. **1**, meshes with a bevel gear **58** mounted on one end of a rotatable connecting or intermediate shaft **60**. The other end of the connecting shaft **60** carries a gear **62** intermeshing with a gear **64** which is mounted on the shaft **46**. Thus, throughout the driven rotation of the rotor **22** by the driving shaft **32**, the shaft **46** is rotatably driven in timed relationship with the driven rotation of the rotor **22** through the gears **64**, **62**, **58**, **56** and the connecting shaft **60**; and resultantly the disc **36** is continuously rotatably driven in timed relationship with the rotor **22** throughout the operation of the pump.

A feed screw **66**, constructed such that its rotation causes the material in the supply chamber **16** to be fed to the rotor pockets **28** in the aforesaid direction transverse to the rotor axis, is fixedly mounted on the shaft **46** coaxial with the disc **36**. Thus, during the aforedescribed driven rotation of the disc **36**, the feed screw **66** is simultaneously rotatably driven to supply material to the rotor pockets **28** in the aforesaid transverse direction.

Throughout the operation of the pump **10**, the drive shaft **36** continuously rotatably drives the rotor **22** in the counterclock-wise direction (as viewed in FIG. **2**); and throughout the rotor rotation the feed screw **66** and disc **36** are conjointly rotatably driven in the aforedescribed manner. Thus, material from the supply chamber **16** is fed to the rotor pockets **28** in a direction transverse to the rotor axis and on one side (i.e., the left-hand side as viewed in FIG. **2**) of the disc **36**. The counterclock-wise rotation of the rotor **22** moves the thus supplied material in the rotor pockets **28** around the lower side of the rotor **22** along the wall **68** of the pumping chamber **14** and towards the other or right-hand side (as viewed in FIG. **2**) of the disc **36** until the disc **36** discharges the material from the pockets **28** in a direction transverse to the rotor axis towards the outlet **20**. This discharge of material from the rotor pockets **28** is schematically depicted by the arrows shown in FIGS. **3** and **4**. The outlet **20** receives this discharged material in a direction transverse to the rotor axis and directs the material to the conduitry or piping (not shown) connected to the outlet **20**.

FIG. **5** fragmentarily illustrates a modified embodiment of the pump which differs from that aforedescribed only in that the disc body **38***a* is more offset laterally to the right-hand or discharge side of the longitudinal axis of the rotor **22***a* and has disc lobes **40***a* which project from the disc body **38***a* towards the rotor axis and engage the rotor **22***a* at its said axis. FIG. **6** fragmentarily illustrates another modified embodiment of the pump which is identical to the pump **10** excepting only that the disc body **38***b* is laterally offset to the left-hand or inlet side of the longitudinal axis of the rotor **22***b* and has lobes **40***b* which project towards such axis and there engage the rotor **22***b*. FIG. **7** fragmentarily illustrates yet another modified embodiment of the pump wherein the disc body **38***c* is mounted generally along the axis of the rotor **22***c* with the disc lobes **40***c* engaging the rotor **22***c* on said axis.

The operation of the FIGS. **5**, **6**, and **7** embodiments is identical to that of the embodiment shown in FIGS. **1** through **4** and, hence, has not been specicically herein described in detail.

Although only four embodiments of the invention have been illustrated and hereinbefore specifically described it will be understood that the invention is not limited merely to these embodiments but rather contemplates other embodiments and variations within the scope of the following claims.

Having thus described my invention, I claim:

1. A pump comprising housing means, rotor means in said housing means rotatably driven about a longitudinal axis and including peripheral rotor pockets extending generally spirally therearound, said rotor pockets each longitudinally extending around only a portion of the periphery of said rotor means and having their ends closed inwardly of the ends of said rotor means, disc means in said housing means rotatably mounted about an axis transverse to said axis of said rotor means, said disc means including a plurality of peripheral lobes received in said rotor pockets for discharging material from said rotor pockets in a direction transverse to said axis of said rotor means, supply means for supplying material to be pumped to said rotor pockets on one side of said disc means in a direction transverse to said axis of said rotor means, said supply means being connected to said rotor pockets by a connection extending the full length of said rotor pockets, the driven rotation of said rotor means being in a rotary direction to cause such supplied material to be rotated in said rotor pockets towards the other side of said disc means whereby the material is discharged from said rotor pockets by said disc means adjacent said other side thereof in a direction transverse to said axis of said rotor means, and discharge means for receiving the material discharged from said rotor pockets by said disc means.

2. A pump according to claim 1, wherein said rotor pockets each at the most extend around only about one-half of the periphery of said rotor means.

3. A pump according to claim 1, wherein said rotor means includes at least three of said rotor pockets.

4. A pump according to claim 1, further comprising means separate from said rotor means and said disc means interconnecting said rotor means and said disc means to cause said disc means to be rotatably driven in timed relationship with said rotor means.

5. A pump according to claim 4, wherein said interconnecting means comprises gear means, said supply means includes a feed screw in said housing means, and said discharge means includes a discharge conduit arranged to receive the discharged material in a direction transverse to said axis of said rotor means.

6. A pump according to claim 1, wherein said disc means is offset to one side of said axis of said rotor means.

7. A pump according to claim 1, wherein said disc means laterally extends along said axis of said rotor means.

8. A pump according to claim 1, wherein said axis of said disc means is above said axis of said rotor means.

9. A pump according to claim 1, wherein said disc means comprises only a single disc.

10. A pump comprising a housing containing a pumping chamber, a rotor in said pumping chamber rotatable about a longitudinal axis and including at least three peripheral pockets longitudinally extending generally spirally therearound, said rotor pockets each at the most longitudinally extending around only about one-half of the rotor periphery and having their ends closed inwardly of the ends of said rotor, a single disc rotatably mounted in said housing for rotation about an axis transverse to said rotor axis, said disc having a plurality of lobes sealingly received in said rotor pockets for discharging material from said rotor pockets in a direction transverse to said rotor axis as such material is rotated in said rotor pockets towards said disc, supply means including a supply chamber in said housing connected to said pumping chamber for supplying material to be pumped to said rotor pockets on one side of said disc in a direction radially of said rotor, the connection between said supply chamber and said pumping chamber extending the full length of said rotor pockets, driving means connected to said rotor for rotatably driving said rotor about its said axis in a rotary direction to cause the material supplied to said rotor pockets to be rotated therein towards the other side of said disc whereby the material is discharged from said rotor pockets by said disc lobes adjacent such other side radially of said rotor, and discharge means connected to said pumping chamber to receive the material discharged from said rotor pockets by said disc lobes.

11. A pump according to claim 10, wherein said rotor pockets each longitudinally extend the major portion of the length of the rotor.

12. A pump according to claim 10, wherein said discharge means includes a discharge conduit arranged to receive the discharge material in a direction transverse to said rotor axis.

13. A pump according to claim 10, wherein said disc laterally extends generally along said axis of said rotor.

14. A pump according to claim 10, wherein said disc is offset to a side of said rotor axis.

15. A pump according to claim 10, wherein said disc axis is above said rotor axis.

16. A pump according to claim 10, further comprising sealing means for preventing flow of material from said pumping chamber along one side face of said disc.

17. A pump comprising housing means, rotor means in said housing means rotatably driven about a longitudinal axis and including peripheral rotor pockets extending generally spirally therearound, said rotor pockets each longitudinally extending around only a portion of the periphery of said rotor means and having their ends closed inwardly of the ends of said rotor means, disc means in said housing means rotatably mounted about an axis transverse to said axis of said rotor means, said disc means including a plurality of peripheral lobes received in said rotor pockets for discharging material from said rotor pockets in a direction transverse to said axis of said rotor means, supply means for supplying material to be pumped to said rotor pockets on one side of said disc means in a direction transverse to said axis of said rotor means, the driven rotation of said rotor means being in a rotary direction to cause such supplied material to be rotated in said rotor pockets towards the other side of said disc means whereby the material is discharged from said rotor pockets by said disc means adjacent said other side thereof in a direction transverse to said axis of said rotor means, said supply means including a feed screw in said housing means, shaft means mounting both said feed screw and said disc means, means interconnecting said shaft means with said rotor means to cause said shaft means to be rotatably driven in timed relationship with said rotor means, and discharge means for receiving the material discharged from said rotor pockets by said disc means.

18. A pump according to claim 17, wherein said disc means comprises only a single disc.

19. A pump comprising a housing containing a pumping chamber, a rotor in said pumping chamber rotatable about a longitudinal axis and including at least three peripheral pockets longitudinally extending generally spirally therearound, said rotor pockets each at the most longitudinally extending around only about one-half of the rotor periphery and having their ends closed inwardly of the ends of said rotor, a disc rotatably mounted in said housing for rotation about an axis transverse to said rotor axis, said disc having a plurality of lobes sealingly received in said rotor pockets for discharging material from said rotor pockets in a direction transverse to said rotor axis as such material is rotated in said rotor pockets towards said disc, supply means including a supply chamber in said housing for supplying material to be pumped to said rotor pockets on one side of said disc in a direction transverse to said axis of said rotor, said supply means further comprising a feed screw in said supply chamber for causing the material to be pumped to be supplied to said rotor pockets in a direction transverse to said rotor axis, driving means connected to said rotor for rotatably driving said rotor about its said axis in a rotary direction to cause the material supplied to said rotor pockets to be rotated therein towards the other side of said disc whereby the material is discharged from said rotor pockets by said disc lobes adjacent such other side in a direction transverse to said rotor axis, and discharge means connected to said pumping chamber to receive the material discharged from said rotor pockets by said disc lobes.

20. A pump according to claim 19, further comprising a rotatable shaft supporting both said feed screw and said disc, and means interconnecting said shaft with said rotor to cause said shaft to be rotatably driven in timed relationship with the driven rotation of said rotor.

21. A pump comprising a housing containing a pumping chamber and a supply chamber connected to one side of said pumping chamber for supplying material to be pumped to said pumping chamber at said one side thereof, discharge means connected to the opposite side of said pumping chamber for removing material therefrom, a rotor in said pumping chamber having its longitudinal axis transverse to the connections of said pumping chamber to said supply chamber and said discharge means, said rotor being rotatable about its said longitudinal axis and including a plurality of peripheral pockets which longitudinally extend generally spirally therearound for the major portion of the rotor length, said rotor pockets having their ends closed by portions of said rotor adjacent the ends of said rotor, a feed screw in said supply chamber for supplying material to be pumped to said rotor pockets in a direction transverse to said rotor axis, a disc in said housing mounted for rotation about an axis transverse to said rotor axis, said disc preventing passage of material between said supply chamber and said discharge means around one side of said rotor and including a plurality of peripheral lobes sealingly received in said rotor pockets for discharging material from said rotor pockets as such material is rotated towards said disc around the other side of said rotor by rotation of said rotor, and driving means connected to said rotor for rotatably driving said rotor about its said longitudinal axis in a rotary direction to cause the material supplied to said rotor pockets to be moved therein towards said disc around said other side of said rotor whereby the material is discharged from said rotor pockets by said disc on the same side of said disc as said discharge means.

22. A pump according to claim 21, further comprising a rotatable shaft supporting both said disc and said feed screw, and means interconnecting said shaft with said rotor to cause said shaft to be rotatably driven in timed relationship with the driven rotation of said rotor.

23. A pump according to claim 21, wherein said disc is offset to one side of said rotor axis.

24. A pump according to claim 21, wherein said disc laterally extends generally along said rotor axis.

25. A pump according to claim 21, wherein said disc axis is above said rotor axis.

26. A pump according to claim 21, further comprising sealing means for preventing flow of material from said pumping chamber to said supply chamber along the side face of said disc most adjacent to said discharge means.

27. A pump according to claim 26, wherein said disc extends into said supply chamber and at a portion of its periphery is spaced from a wall bounding said supply chamber.

28. A pump according to claim 27, wherein said sealing means is intermediate said disc and said wall.

29. A pump or the like comprising a housing, a rotor in said housing rotatably mounted about a longitudinal axis and including peripheral rotor pockets extending generally spirally therearound, said rotor pockets each having their ends closed inwardly of the ends of said rotor to prevent passage of material to-and-from said rotor pockets at the ends of said rotor, a single disc in said housing rotatably mounted about an axis transverse to said axis of said rotor and including peripheral lobes received in said rotor pockets for preventing passage of material in said rotor pockets around one side of said rotor, supply means for supplying material to said rotor pockets on one side of said disc in a direction radially of said rotor, said supply means being connected to said rotor pockets by a connection extending the length of said rotor pockets, said rotor being rotatably driven in a direction to cause such supplied material to pass in said rotor pockets around the other side of said rotor whereupon the material is discharged from said rotor pockets adjacent said other side of said disc in a direction radially of said rotor, and discharge means for receiving such discharged material.

30. A pump or the like comprising a housing containing a rotor chamber and a supply chamber connected to one side of said rotor chamber for supplying material to said one side of said rotor chamber, discharge means connected to the opposite side of said rotor chamber for removing material therefrom, a rotor in said rotor chamber having its longitudinal axis transverse to the connections of said rotor chamber to said supply chamber and said discharge means, said rotor being rotatable about its said longitidinal axis and including peripheral pockets which longitudinally extend generally spirally therearound, said rotor pockets having their ends closed by portions of said rotor adjacent

the ends of said rotor, a disc in said housing mounted for rotation about an axis transverse to said rotor axis, said disc preventing passage of material between said supply chamber and said discharge means around one side of said rotor and including peripheral lobes sealingly received in said rotor pockets for discharging material from said rotor pockets as such material is rotated towards said disc around the other side of said rotor during rotation of said rotor, the connection between said supply chamber and said rotor chamber extending the full length of said rotor pockets, and said rotor being rotatably driven about its said longitudinal axis in a rotary direction to cause the material supplied to said rotor pockets to be moved therein towards said disc around said other side of said rotor whereby the material is discharged from said rotor pockets on the same side of said disc as said discharge means.

31. A pump or the like comprising a housing containing a rotor chamber and a supply chamber connected to one side of said rotor chamber for supplying material to said one side of said rotor chamber, discharge means connected to the opposite side of said rotor chamber for removing material therefrom, a rotor in said rotor chamber having its longitudinal axis transverse to the connections of said rotor chamber to said supply chamber and said discharge means, said rotor being rotatable about its said longitudinal axis and including peripheral pockets which longitudinally extend generally spirally therearound, said rotor pockets having their ends closed by portions of said rotor adjacent the ends of said rotor, a disc in said housing mounted for rotation about an axis transverse to said rotor axis, said disc preventing passage of material between said supply chamber and said discharge means around one side of said rotor and including peripheral lobes sealingly received in said rotor pockets for discharging material from said rotor pockets as such material is rotated towards said disc around the other side of said rotor during rotation of said rotor, said disc extending into said supply chamber and having its face most adjacent to said discharge means spaced from a wall bounding said supply chamber, sealing means intermediate said disc face and said wall for preventing flow of material from said rotor chamber along said disc face, and said rotor being rotatably driven about its said longitudinal axis in a rotary direction to cause the material supplied to said rotor pockets to be moved therein towards said disc around said other side of said rotor whereby the material is discharged from said rotor pocket on the same side of said disc as said discharge means.

32. A pump or the like according to claim **31**, wherein the connection between said supply chamber and said rotor chamber extends the full length of said rotor pockets.

33. A pump comprising a housing containing a pumping chamber, a rotor in said pumping chamber rotatable about a longitudinal axis and including at least three peripheral pockets longitudinally extending generally spirally therearound, said rotor pockets each at the most longitudinally extending around only about one-half of the rotor periphery and having their ends closed inwardly of the ends of said rotor, a disc rotatably mounted in said housing for rotation about an axis transverse to said rotor axis, said disc having a plurality of lobes sealingly received in said rotor pockets for discharging material from said rotor pockets in a direction transverse to said rotor axis as such material is rotated in said rotor pockets towards said disc, supply means including a supply chamber in said housing for supplying material to be pumped to said rotor pockets on one side of said disc in a direction transverse to said axis of said rotor, driving means connected to said rotor for rotatably driving said rotor about its said axis in a rotary direction to cause the material supplied to said rotor pockets to be rotated therein towards the other side of said disc whereby the material is discharged from said rotor pockets by said disc lobes adjacent such other side in a direction transverse to said rotor axis, discharge means connected to said pumping chamber to receive the material discharged from said rotor pockets by said disc lobes, and sealing means for preventing flow of material from said pumping chamber to said supply chamber along the side face of said disc on said other side thereof.

34. A pump according to claim **17**, wherein said supply means is connected to said rotor pockets by a connection extending the full length of said rotor pockets.

35. A pump according to claim **21**, wherein said supply chamber is connected to said pumping chamber by a connection extending the full length of said rotor pockets.

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