

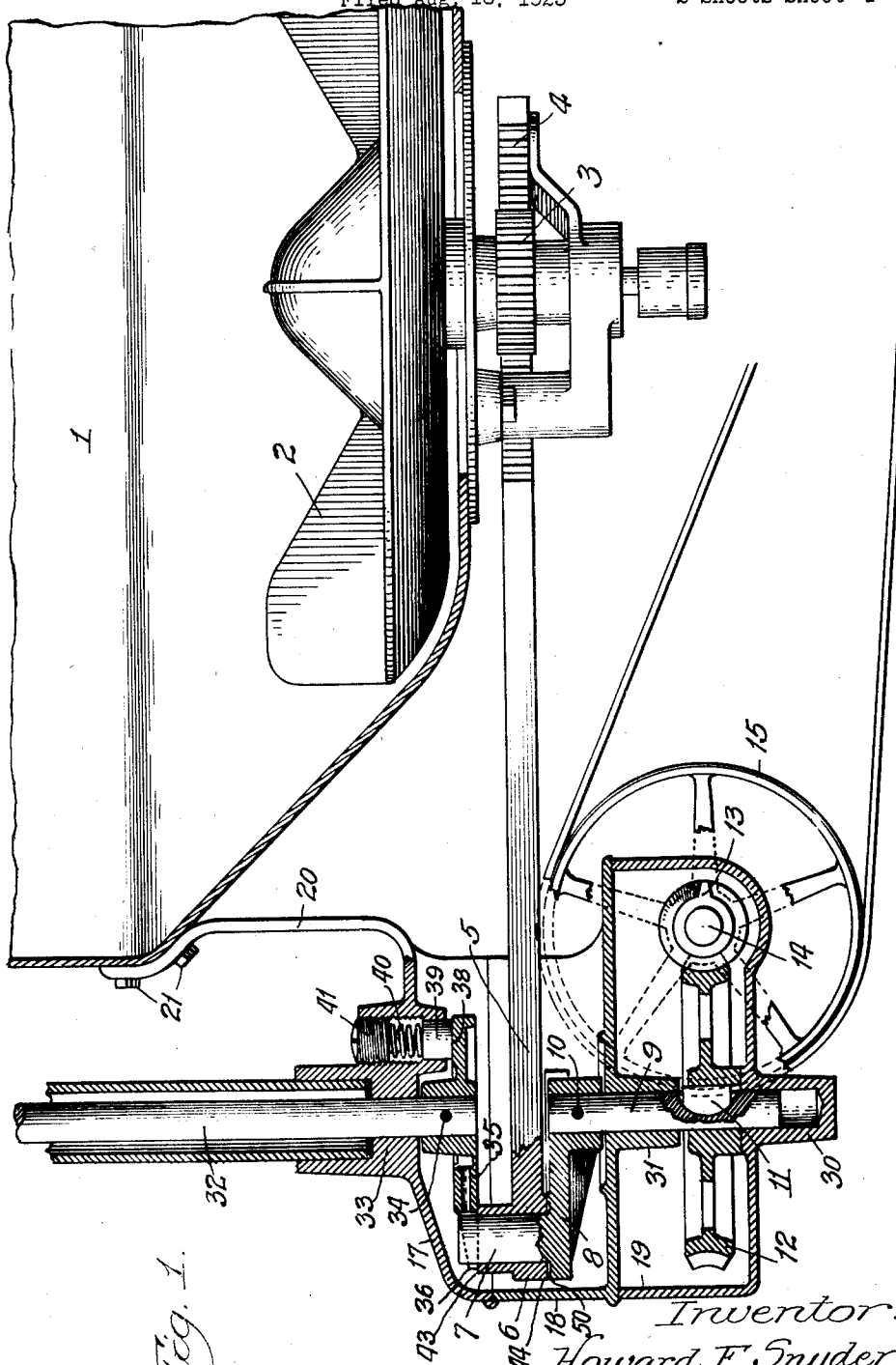
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1,657,699

H. F. SNYDER
DRIVING MECHANISM

Filed Aug. 18, 1923

2 Sheets-Sheet 1



Inventor:
Howard F. Snyder,
by Wallace R. Lane.

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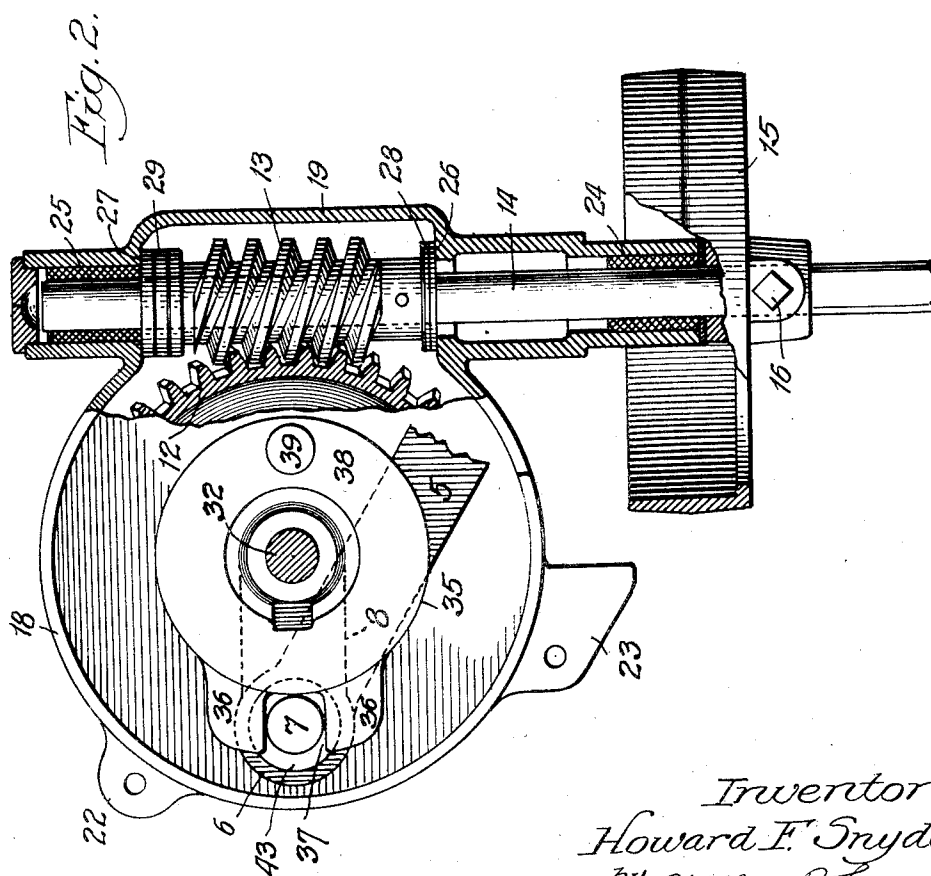
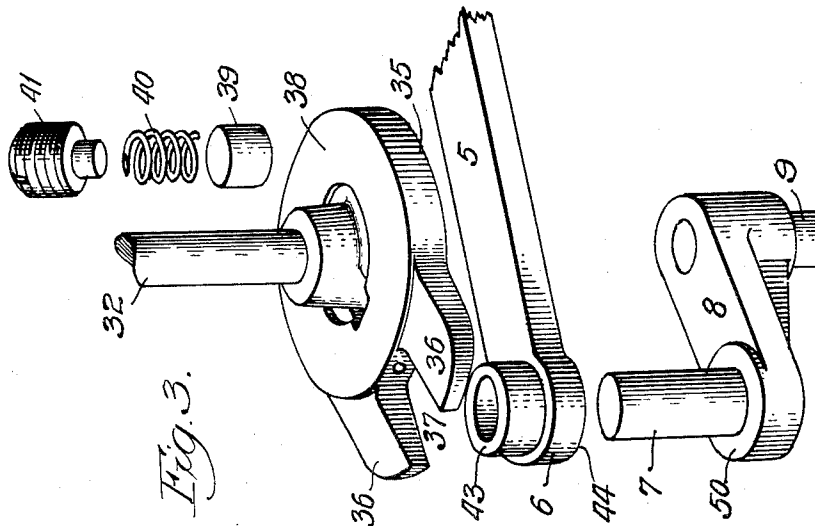
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DRIVING MECHANISM

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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THE MAYTAG COMPANY, OF NEWTON, IOWA, A CORPORATION OF DELAWARE.

DRIVING MECHANISM.

Application filed August 18, 1923. Serial No. 658,076.

The present invention relates to driving mechanisms and has more particular reference to the type of driving device used in washing machines having alternately rotating agitator and wringer mechanism operated from a common driving source, it being understood that such machine is here referred to as merely illustrative of an adaptation or employment of the invention, of which there may be others without departing from the spirit of the invention.

Among the objects of the invention are to provide a driving mechanism of the kind disclosed with means for preventing or precluding chucking action or slapping of the parts of the mechanism which might ordinarily arise or occur from irregular operation of the driven apparatus or a change in the load imposed thereby upon the driving mechanism; with novel means for making reciprocatory operations of driven parts smooth without the annoyance of chucking or slapping noises as the reciprocated means alternates in motion; with novel means for precluding chucking or slapping action and the attendant annoying noises that might ordinarily arise from a change of load, as for example, the throwing off of a load, such as the wringer mechanism of a washing machine while the remainder of the machine continues to operate, and where the loaded parts continuing to be driven might overrun or tend to over-run to the extent of effecting such chucking action; with means for imposing a given normal load upon the mechanism so that when part of the operated device is thrown out of operation, such as when the wringer device is unclutched or stopped, the imposed load will still maintain the parts of the driving mechanism in driving engagement or relation whereby no back-lashing or slapping will occur or if any change in relation of parts does occur it will be gradual and wholly unnoticeable; and to provide for such other and further objects, advantages and capabilities as will later more fully appear and are inherently possessed by the invention.

In the drawings illustrating a preferred adaptation of the invention, Fig. 1 is a part sectional view through a washing machine tub and driving mechanism constructed in accordance with the invention; Fig. 2 is a

view partly in top plan and partly in section of the driving mechanism; and Fig. 3 is a perspective view in separated assembly of certain details of the driving means.

Referring now more particularly to the drawings, one form of device selected to illustrate the invention is shown in connection with a washing machine having a tub 1 and the lower part of which is supported and an alternating reciprocatory liquid impelling member 2 extending downwardly through the bottom of the tub in any suitable manner and connected to a gear 3 with which is operatively meshed a rack 4 which is capable of reciprocation and giving the liquid impelling member an alternating rotary motion.

The outer end portion of pitman part 5 of the rack is formed with a bearing hub 6 bored to receive a crank pin 7 either forming an integral part or rigidly fastened to a crank arm 8 suitably secured to the upper end of a drive shaft 9 as by way of a cross pin 10, as clearly shown in Fig. 1 of the drawings.

To the lower end portion of the shaft 9 is suitably keyed, as by a Woodruff key 11, a worm gear 12 operatively engaged or meshed with a worm 13 secured to a horizontal shaft 14 having, at an outer end thereof, a driving pulley 15 suitably fastened to the shaft 14, as by way of a set-screw 16, as clearly shown in Fig. 2 of the drawings.

The driving mechanism is enclosed in a housing comprising an upper section 17, an intermediate section 18 and a lower section 19 suitably connected together and supported partly by a bracket 20 fastened to a side of the tub 1 by means of bolts 21 and the lower section having apertured ears 22 and 23 for attachment to a stationary part of the washing machine. The lower section 19 is provided with bearings 24 and 25 for the worm shaft 14 and thrust bearings 26 and 27 for thrust collars 28 and 29 fastened to the shaft 14. The intermediate section 18 and lower section 19 are provided with bearings 30 and 31 for the vertical drive shaft 9.

Above the shaft 9 and in alinement with it is a wringer shaft 32 rotatably supported in a bearing 33 in the upper section 17 of the housing, and having secured at the lower end of the shaft 32, as by means of a cross

pin 34, is a second crank member or coupling plate 35 having a pair of radially extending coupling elements 36 formed with a notch 37 therebetween for loosely receiving the pin 7 of the lower crank or coupling element. The plate 35 has a smooth upper friction surface 38 for the engagement therewith of a friction block 39, preferably a piece of wood, capable of having frictional engagement with the surface 38 for imposing a frictional resistance or load drag thereon. The frictional member 39 is normally pressed against the plate 35 by any resilient element such as a spring 40 whose tension or compression may be regulated by a regulating screw 41 threaded into a threaded socket formed in the upper section 17 of the housing, as clearly shown in Fig. 1 of the drawings.

From the above it will be apparent that the driving mechanism operates two driven means, one including the pitman 5, rack 4 and the agitator 2 in the tub 1, and the other a wringer shaft 32 and the wringer mechanism connected thereto (not shown). In the operation of a washing machine, the wringer mechanism may or may not be operating at the same time when the remainder of the machine is operating. It has been found that with usual constructions, prior to this invention, when the wringer load is disconnected or thrown off there is a chucking or back-slapping action causing an annoying noise. Also owing to variations in manufacture and looseness arising from wear the alternate reciprocation of the pitman 5 and the rack 4 will also have chucking action between the bearing 6 and the pin 7 of the crank 8, also causing the same noise. In order to avoid this the friction means, including the block 39, is provided to frictionally engage with the disc 35 so as to impose upon it a resistance or load or drag so that when the wringer is thrown out of operation, as by unclutching the same, there would still be a sufficient load or drag upon the parts as to maintain the train of the driving mechanism in the same relation as before without a change of relation of parts causing chucking or back-slapping.

The bearing member 6 is also provided with an end friction surface 43 against which presses the under surfaces of the projections 36 of the disc 35, and the other end of the bearing member 6 has a bearing surface 44 which frictionally engages with an annular portion 50 of the crank so that there is frictional engagement between the bearing 6 and the projections 36 as well as the crank portion 50. This frictional engagement may be varied or regulated by the regulating screw 41 pressing against the spring 40 and the friction member 39, which reacts against the disc 35 to impose pressure upon the bearing member 6 and the crank

portion 50. The shaft 32 together with the disc 35 is longitudinally movable to the extent of permitting this adjustment.

From the above it will be apparent that any tendency to chucking action between the pitman 5 and the pin 7 will be checked or precluded by the frictional engagement between the sleeve 6 of the pitman and the projections 36 of the disc or plate 35 and the frictional portion 50 of the crank arm 8. In this way any tendency for the washing mechanism, including the pitman 5, to over-run at the ends of the reciprocations thereof will be prevented by the frictional engagement of the parts above mentioned and the chucking action or slapping noises will be avoided.

The present application discloses subject matter which is an improvement on the more generic details of construction shown in my pending application Serial No. 477,888, filed June 16, 1921, for which broad subject matter a divisional application is being filed.

While I have herein described and shown upon the drawings a preferred embodiment of the invention, it is to be understood that it is merely illustrative thereof, and that it is not limited to the particular construction, details and arrangement of parts shown and described, but that other constructions, details and arrangements of parts are comprehended by the invention without departing from the spirit thereof.

Having now described my invention, I claim:

1. In a driving mechanism, a driving crank, means reciprocally driven by the crank, means rotatively driven by the crank, and means imposing a given frictional engagement between the crank and the reciprocally and rotatively driven means whereby tendency to chucking between the crank and reciprocally driven and rotatively driven means is prevented.

2. In a driving mechanism, a driving crank, a pitman pivotally connected to the crank, a driven crank operatively connected to said driving crank, and means constantly pressing the pitman and driven crank against the driving crank in an axial direction for frictionally resisting chucking action between the pitman and cranks.

3. In a driving mechanism, a rotating driving member having a drive pin eccentric to the axis of rotation of said member, a reciprocable driving element pivotally connected to the pin, a driven crank operatively connected to the pin, and means causing axial frictional engagement between said element, crank and pin for resisting chucking action between the same.

4. In a driving mechanism of the character disclosed, a rotatable driving member having an eccentric driving element, a reciprocally driven means rotatably connected to said element, a rotatably driven means having an

eccentric slot operatively receiving said element, and resistance means for imposing a given load on said rotatably driven means to eliminate chucking action of the element in the slot.

5 5. A silencing device for driving mechanisms, comprising a continuously rotatable member, friction means for imposing a given load on said member, a driving crank, said member cooperable with said crank to be driven thereby, said crank and member having frictional engagement for preventing over-running of said member.

15 6. In a driving mechanism of the character disclosed, rotatable driving and driven members, a coupling connected therebetween and having elements in driving engagement with each other, a reciprocally driven means connected to one of said elements, and means for imposing given frictional resistance in said engagement and said connection for preventing chucking action between said elements and between said reciprocally driven means and the element connected thereto.

25 7. In a driving mechanism of the character disclosed, aligned rotatable driving and driven shafts, means operatively coupling said shafts for continuous rotatability of the driven shaft and having eccentrically connected members forming a driving crank, a reciprocable element connected to said crank between said members, and means having frictional engagement with the driven member of the eccentrically connected members for urging said members into snug operative engagement and imposing a given load upon the driving mechanism whereby chucking between the eccentrically connected members is precluded.

40 8. In a driving mechanism of the character disclosed, aligned rotatable driving and driven shafts, means operatively coupling said shafts for continuous rotatability of the driven shaft and having eccentrically connected members, a reciprocally driven means operatively connected to one of said members, and means effecting given frictional engagement between said reciprocally driven means and the member operatively connected thereto for precluding chucking action therebetween.

55 9. In a driving mechanism of the character disclosed, a drive shaft, a driven shaft, a reciprocable member, a loose coupling connecting the driving shaft to said driven shaft and to said reciprocable member, and means for precluding chucking action between the parts of the coupling and between the reciprocable member and the coupling.

60 10. In a driving mechanism, a power driven member, means connected to and reciprocatingly driven by said power driven member, means connected to and rotatively driven by said power member and common means for eliminating loose play between

the said power driven member and said reciprocable and rotary driven members.

11. In a driving mechanism, a power driven member, means permanently connected thereto and adapted to be reciprocated thereby, means permanently connected thereto and adapted to be constantly rotated thereby, said latter means being constructed and arranged to vary from no load to full load and means cooperating with said power driven member and said rotatable member for eliminating loose play when said load is removed.

12. In a driving mechanism of the character disclosed, aligned rotatable driving and driven shafts, means cooperatively coupling said shafts for continuous rotatability of the driven shaft, said means having eccentrically disposed portions forming a driving crank, a reciprocable element connected to said crank between said portions, and means having frictional engagement with the driven member of the eccentrically connected portions for imposing a given load upon the driving mechanism whereby chucking between the eccentrically connected portions is precluded.

13. In a device of the character described the combination of a power shaft having a crank arm and a crank pin, an aligned driven shaft adapted to carry a load or no load and having a crank arm adapted to engage the pin whereby said aligned shaft is continuously rotated from the power shaft, a pitman operatively driven by the crank arm and actuating a member in alternately reverse directions and means for retarding the rotation of the second shaft when there is no load on such shaft.

14. In a device of the character described the combination of a power shaft and an aligned driven shaft the latter being adapted to carry a load or no load, a crank adapted to connect said shafts and to rotate the aligned shaft continuously from the power shaft, a pitman connected to the crank for driving a member alternatively in opposite directions and means for retarding the rotation of the aligned shaft when it has no load.

15. In a device of the character described the combination of a power shaft having a crank arm formed with an outstanding pin, an aligned driven shaft having a crank arm adapted to engage the pin so as to be continuously rotated by the power shaft, a pitman engaging the pin of the crank arm, the crank arm of the driven shaft having a friction surface and a drag member pressing against said surface.

16. In a device of the character described the combination of a power shaft having a crank arm formed with an outstanding pin, an aligned driven shaft having a crank arm adapted to engage the pin so as to be con-

tinuously rotated by the power shaft, a pitman engaging the pin of the crank arm and adapted to drive a member in alternate reverse directions, the crank arm of the driven shaft having a friction surface concentrically surrounding the shaft, and a friction block adapted resiliently to press against said surface, and means for adjusting the pressure of the friction block against said surface.

17. In a device of the character described the combination of a power shaft having a crank arm formed with an outstanding pin, an aligned driven shaft having a forked or slotted crank arm adapted to engage the pin so as to be continuously rotated by the power shaft, a pitman engaging the pin of the crank arm and adapted to drive a member in alternate reverse directions, the crank arm of the driven shaft having a friction surface concentrically surrounding the shaft,

and a friction block adapted resiliently to press against said surface at the side opposite the connection of the arm and the pin.

18. In a device of the character described the combination of a power shaft having a crank arm formed with an outstanding pin, a pitman having an apertured end mounted on said pin and adapted to actuate a member alternately in reverse directions, an aligned shaft having a forked arm connecting with said pitman and pin so as to be continuously rotated by the power shaft, said crank arm of the driven shaft having a friction surface concentrically surrounding the driven shaft, and a friction block adapted resiliently to press against the friction surface and thereby press the forked crank arm against the pitman.

In witness whereof, I hereunto subscribe my name to this specification.

HOWARD F. SNYDER.