Sept. 8, 1959 D. L. MOOAR 2,902,871

TUMBLER DRIVE

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Fig.1.

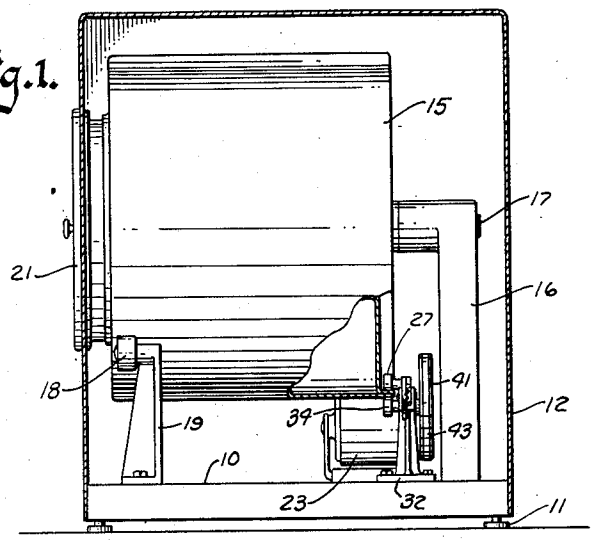


Fig.3.

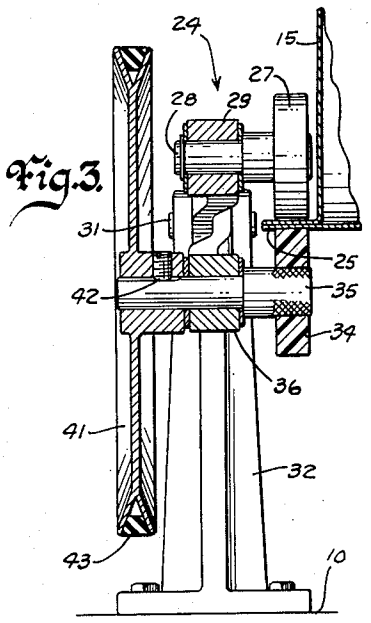


Fig.4.

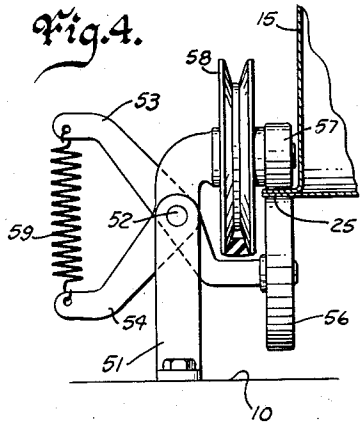
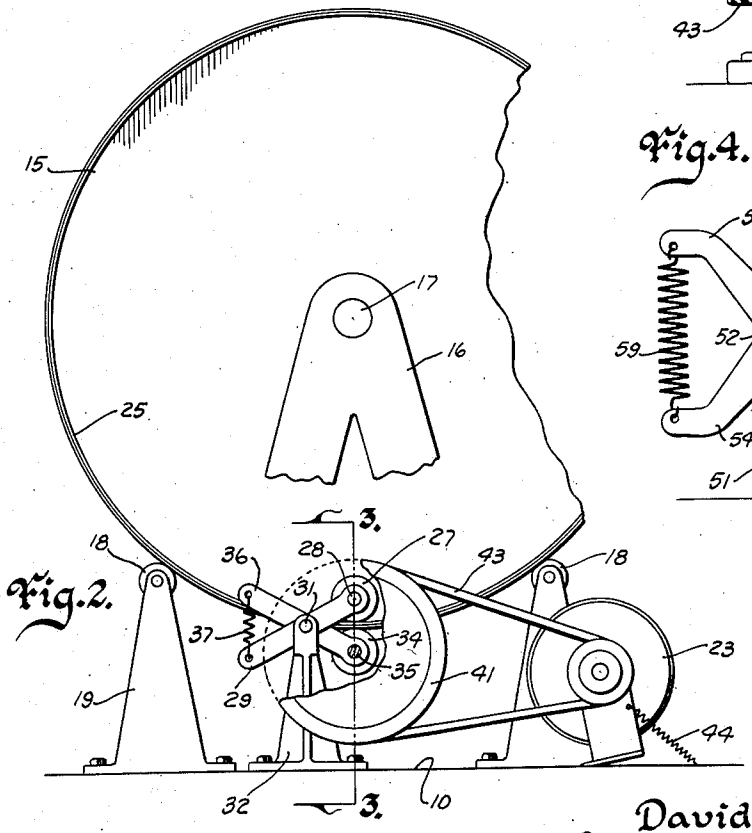


Fig.2.



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TUMBLER DRIVE

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11 Claims. (Cl. 74—209)

This invention relates generally to a drive mechanism for rotating horizontally mounted revoluble drums or tumblers and relates in particular to a floating drive mechanism for driving a tumbler in a clothes drier.

While it has been prevailing practice to rotate horizontally mounted clothes tumblers by rotating a shaft connected to the tumbler at its rotational axis, clothes tumblers have also been driven by drive mechanisms engaging one or more portions of the tumbler periphery. These peripheral tumbler drives have been used for tumblers supported either partially or entirely on supporting rollers, including both driving and idler rollers, or by a combination of supporting rollers and supporting shafts connected to the drum and its rotational axis. This invention is concerned with a peripheral drive mechanism which can be readily adapted to any of these mounting structures.

The difficulties encountered in the prior types of peripheral drives have included noise problems caused by the imperfectly shaped drums bouncing over the drive and idler rollers, improper tumbler alignment caused by the tumbler's moving axially relative to the supporting rollers, and some slippage between the drive rollers and the drum which tended to result in the overheating of fabrics within the drum. The present invention can eliminate or reduce these problems depending upon the particular application to which it may be put. The invention disclosed hereinafter is primarily concerned with the concept of driving a tumbler provided with a peripheral flange that is respectively engaged on its opposite sides by two rollers one or both of which may be driving rollers and both of which are revolubly mounted at the ends of a pair of pivoted levers having their opposite ends urged together by a tension spring to apply a pincer-like action to the rollers and thereby maintain these rollers in constant engagement with a peripheral flange.

In the accompanying drawings:

Figure 1 is a side elevation, partially broken away, of a clothes drier embodying my invention;

Figure 2 is an enlarged rear elevation, partially broken away, showing the drier of Figure 1 without a casing;

Figure 3 is an enlarged cross-sectional view of the peripheral drive shown in Figures 1 and 2 and taken along line 3—3 of Figure 2; and,

Figure 4 represents a view similar to that of Figure 3 showing a second embodiment of my invention.

Referring now to the accompanying drawings for a more complete constructional and operational description of my invention, base frame **10** is shown supported on the adjustable legs **11** and connected to the cabinet **12** enclosing the entire clothes drying mechanism. Fixed to base frame **10** and forming a rear support for the revoluble clothes drum **15** is the support member **16** formed of an inverted V shape and provided with a bearing at its apex to receive the revoluble drum support shaft **17** connected to drum **15** at its rotational axis. While the support member **16** could be modified structurally to provide

a single support strong enough to rigidly support drum **15**, the disclosed embodiment utilizes an additional support in the form of supporting rollers **18** revolubly mounted on the upstanding support members **19** which are fastened to base frame **10** near the front of the clothes drier to thereby form a support at the forward periphery of drum **15**.

While not shown in detail, access into drum **15** is provided through door **21** mounted concentrically to the rotational axis of drum **15**.

Drum **15** is driven by the pivotally mounted motor **23** through a peripheral drum drive assembly generally indicated by the numeral **24** (Figure 3) which engages the cylindrical flange **25** formed at the rear of drum **15** by the cooperation of the back wall with the cylindrical side wall of drum **15**. Flange **25** is engaged on its inner surface by a pressure idler roller **27** connected to a stub shaft **28** journalled in one end of a lever **29** which in turn is pivoted on the pivot pin **31** carried by the upstanding support **32** fastened to base frame **10**.

The external surface of flange **25** is engaged by a drive roller **34** which, like idler roller **27**, is preferably of rubber or some resilient material in order to provide a noiseless efficient friction drive. Drive roller **34** is affixed to the drive shaft **35** which is revolubly mounted in and extends through the lever member **36** which, like lever **29**, is pivoted on pivot pin **31** and which is connected at its opposite end to the opposite end of lever **29** by means of the tension spring **37**. The action of tension spring **37** on levers **29** and **36** produces a pincer-like action by rollers **27** and **34** on flange **25**.

That portion of the drive shaft **35** extending through lever **36** is attached to a drive pulley **41** by means of set screw **42**. Drive pulley **41** is rotated by the pivoted motor **23** through belt **43** which is maintained in tension by the tension spring **44** connected between motor **23** and base frame **10**.

With this disclosed construction, it will be apparent that drum **15** is supported to permit its rotation by motor **23** through the drive assembly **24** without being axially shiftable. However, while this is the preferred means of supporting drum **15**, it would not be departing from the spirit of this invention to support drum **15** entirely upon rollers. It will also be appreciated that the noise problem created by the bouncing of a hollow drum over rollers will be entirely eliminated if support **16** is used as the sole support for drum **15**.

In operation, rotation of drive pulley **41** by motor **25** causes the drive roller **34** to rotate drum **15** through flange **25**. The degree of frictional engagement by drive roller **34** against flange **25** is determined by the leverage of levers **29** and **36** as well as by the force exerted by tension spring **37** and the frictional coefficient of drive roller **34**. Since levers **29** and **36** are free to move about pivot pin **31**, it should be apparent that rollers **27** and **34** are in turn free to follow any deviations in flange **25** during the rotation of drum **15**. It will be apperciated that a more positive driving action can be achieved by the use of more than one drive assembly **24** or by the substitution of a second drive roller in place of the idler roller **27** so that flange **25** is moved by two cooperating drive rollers rather than merely one.

Figure 4 shows a second embodiment of my invention which differs from the first embodiment of Figures 1–3 not only by the positioning of the driving roller but also by means of the placement of the pincer members relative to the clothes drum. In Figure 4 the support member **51** corresponding to the support **32** carries a pivot pin **52** which serves as a support for levers **53** and **54** pivoted thereon and mounted at right angles to drum **15**. Lever **53** is provided with a pressure idler roller **56** which is journalled on the lower end of lever **53** while the ad-

jacent upper end of lever **54** similarly journals the floating driver roller **57** which in turn is attached to the drive pulley **58** also journalled on lever **54**. Drive pulley **58** corresponds to the drive pulley **41** and is designed to be driven through a similar drive such as that shown for the embodiment of Figures 1–3.

Like the embodiment disclosed in Figures 1–3, the opposite ends of levers **53** and **54** are urged together by means of a tension spring **59** to apply a pincer-like action on flange **25** through rollers **56** and **57**. While this second embodiment of Figure 4 will not perform as efficiently under wide deviations of drum **15**, this second embodiment can be used to aid in the support of drum **15** as any change in vertical elevation of drum **15** is opposed by the pincer action exerted by the tension spring **59** on the flat surfaced cylindrical rollers **56** and **57**.

In its operation the drive mechanism illustrated in Figure 4 functions substantially the same as that disclosed for the first embodiment. It should be apparent that this embodiment, like that of the first embodiment, can be modified slightly as to the positioning of the driving rollers about the periphery of drum **15** and with respect to the use of a plurality of drive rollers on opposite sides of flange **25**. In addition, while flange **25** has been illustrated as being positioned on the rear wall of drum **15**, the front wall may also be similarly provided with a drive flange together with or to the exclusion of the rear wall flange shown in the accompanying drawings. If so desired, the portion of the cylindrical side wall intermediate the front and back walls of drum **15** may also carry the driving flange.

I claim:

1. In an appliance provided with a revoluble drum, a flange rigidly connected to said drum and extending therefrom in a coaxial relationship to the axis of rotation of said drum, means for rotating said drum comprising, a pair of pivoted levers pivoted on a common axis and each provided with a roller member at one end thereof, said respective rollers engaging opposite sides of said flange, means resiliently urging said levers together to apply a pincer-like action on said flange by said rollers, and means for powering at least one of said rollers to frictionally drive said drum through said flange.

2. In an appliance provided with a revoluble drum, a flange rigidly connected to said drum and extending therefrom in a coaxial relationship to the axis of rotation of said drum, means for rotating said drum comprising, a pair of pivoted levers pivoted on a common axis and each provided with a revolubly mounted roller at one end thereof, said rollers engaging opposite sides of said flange, spring means resiliently urging said levers together to apply a pincer-like action on said flange by said rollers, and means for powering one of said rollers to frictionally drive said drum through said flange.

3. In an appliance provided with a revoluble drum, a flange rigidly connected to said drum and extending therefrom in a coaxial relationship to the axis of rotation of said drum, floating drive means for rotating said drum comprising, an upstanding stationary support, a pair of levers pivoted on a common axis in said support, said levers each being provided with a roller member revolubly mounted on each respective lever, spring means connected to said levers resiliently urging said rollers against said flange, and means for powering one of said rollers to frictionally drive said drum through said flange.

4. In an appliance provided with a revoluble drum, means on said drum defining a peripheral flange thereon, floating drive means for rotating said drum comprising, an upstanding stationary member, a pair of contiguously mounted levers pivoted on a common axis in said upstanding member, each of said levers carrying a roller member revolubly mounted thereon, said roller members engaging opposite sides of said flange, spring means resiliently urging said roller members against said flange in a pincer-like action, and means for driving at least one of said rollers for rotating said drum through a frictional drive between said one roller and said flange.

5. In an appliance provided with a horizontally mounted revoluble drum, an endless peripheral flange on said drum, floating drive means for rotating said drum comprising, an upstanding stationary member carrying a pivot pin thereon, a plurality of levers pivoted and supported on said pivot pin, said pivot pin being positioned between the ends of each lever, said levers each having one end thereof terminating adjacent to said flange, a roller journalled on each of said ends adjacent said flange, a drive member fixed to one of said rollers, spring means connecting ends of said levers opposite said rollers for urging said roller members into frictional contact with said flange in a pincer-like action, and means for powering said drive member to rotate said drum by a frictional drive between said one roller and said peripheral flange.

6. In an appliance provided with a horizontally mounted revoluble drum, means mounting said drum for rotation, floating drive means for rotating said drum comprising, a continuous peripheral flange connected to said drum, an upstanding stationary member carrying a pivot pin, a pair of lever members pivoted on said pivot pin and provided with ends positioned adjacent opposite sides of said flange, a drive roller engaging one side of said flange, a driving member mounted on one of said ends and connected to said drive roller, an idler roller carried by the other of said adjacent ends and engaging the opposite side of said flange, a tension spring interconnecting ends of said lever members opposite said adjacent ends to apply a pincer-like action to said flange by said rollers, and drive means for rotating said driving member to rotate said drum through said drive roller.

7. The invention of claim 6 in which the said lever members are positioned parallel to said drum.

8. The invention of claim 6 in which said lever members are positioned at right angles to said drum.

9. In an appliance provided with a horizontally mounted revoluble drum, means for rotating said drum comprising, a continuous peripheral flange connected to said drum and extending therefrom in coaxial relationship to the rotational axis of said drum, a stationary upstanding member, a pair of levers pivoted on said upstanding member and provided with cylindrical rollers engaging opposite sides of said flange, a revoluble driving member connected to one of said rollers, and spring means urging said rollers against said flange in a pincer-like action to provide a floating frictional drive and support for said drum.

10. In an appliance provided with a horizontally mounted revoluble drum, means for rotating said drum comprising, a continuous flange connected to said drum and extending therefrom in a coaxial relationship to the axis of rotation of said drum, a stationary support member, a pair of levers pivoted on said support member and provided with cylindrical rollers engaging opposite sides of said flange, a revoluble driving member journalled on one of said levers and connected to one of said rollers, and spring means positioned between said levers and urging said rollers against said flange in a pincer-like action to provide a floating frictional drive and support for said drum.

11. In an appliance provided with a horizontally mounted revoluble drum, means for rotating said drum comprising, a continuous flange connected to said drum and extending therefrom in a concentric relationship to the rotational axis of said drum, a stationary support member, a pair of levers pivoted on said support member and mounted perpendicularly to said drum, said levers mounting cylindrical rollers engaging opposite sides of said flange, a revoluble driving sheave journalled on one of said levers and connected to one of said rollers, and spring means resiliently interconnecting said levers and urging said rollers against said flange in a pincer-like ac-

tion to provide a floating frictional drive and support for said drum.

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