Oct. 12, 1948. S. NEWBERY 2,451,403

MACHINE USED IN LAUNDRIES FOR WASHING OR DRYING ARTICLES

Original Filed Dec. 9, 1944 3 Sheets-Sheet 1

FIG. 1.

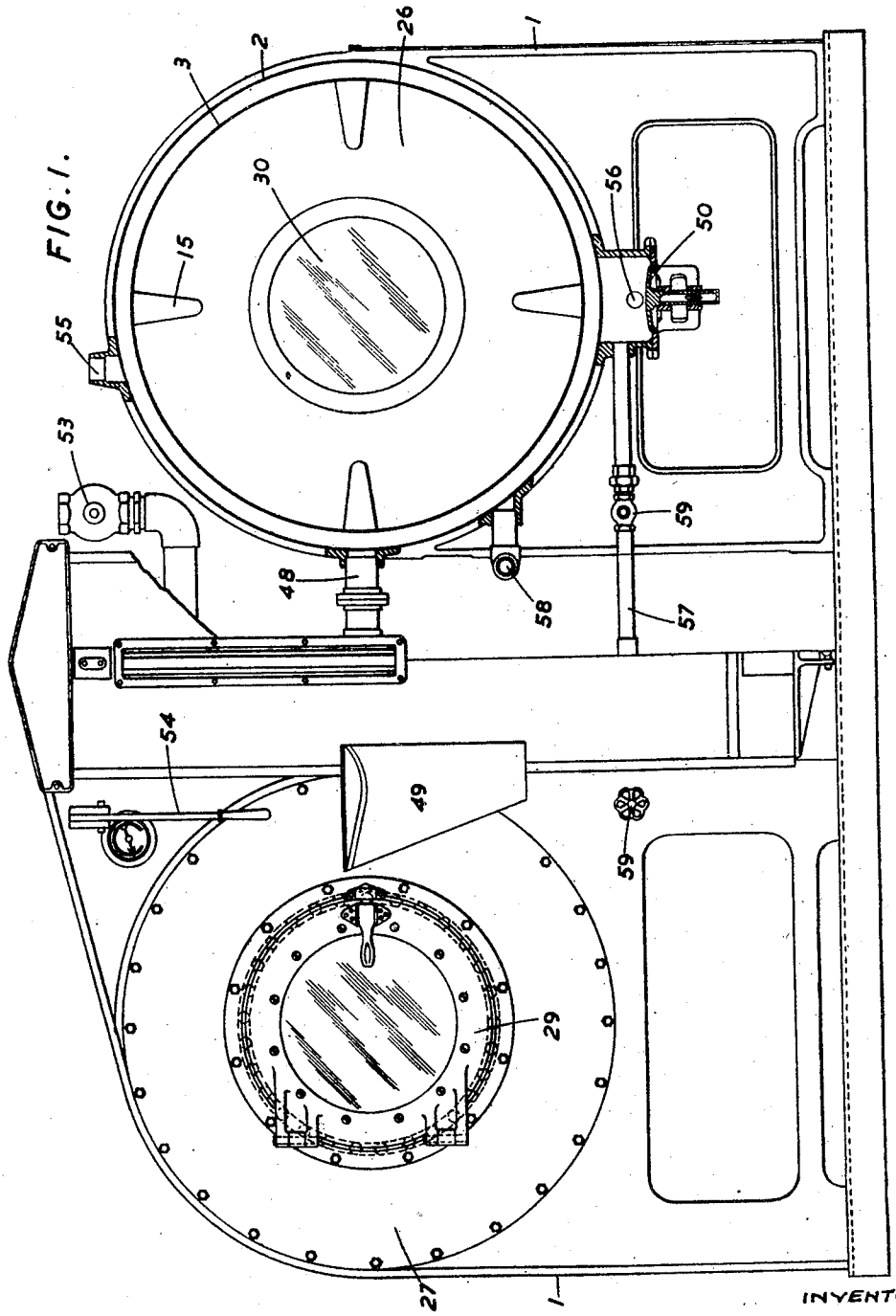

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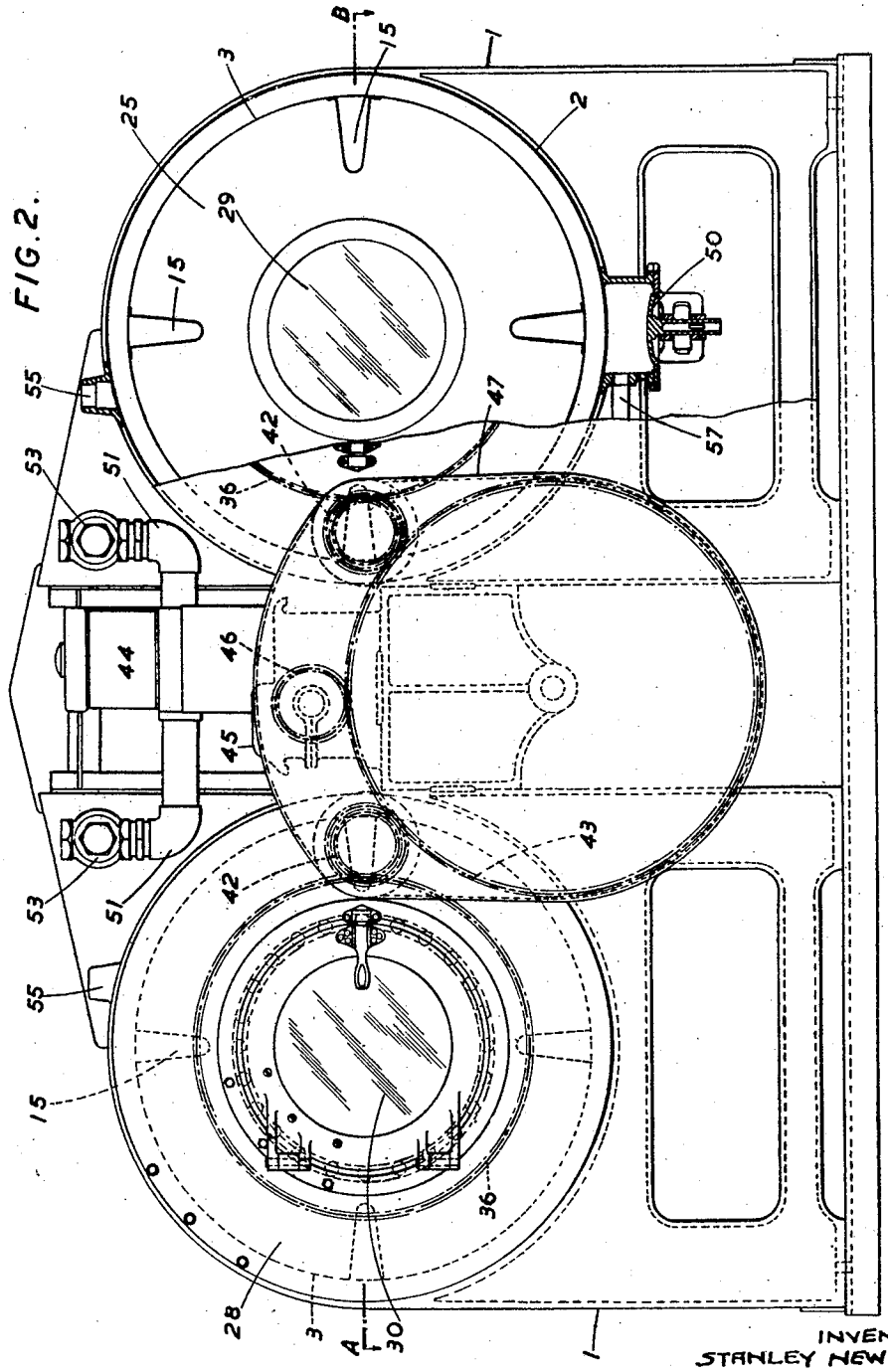
FIG. 2.



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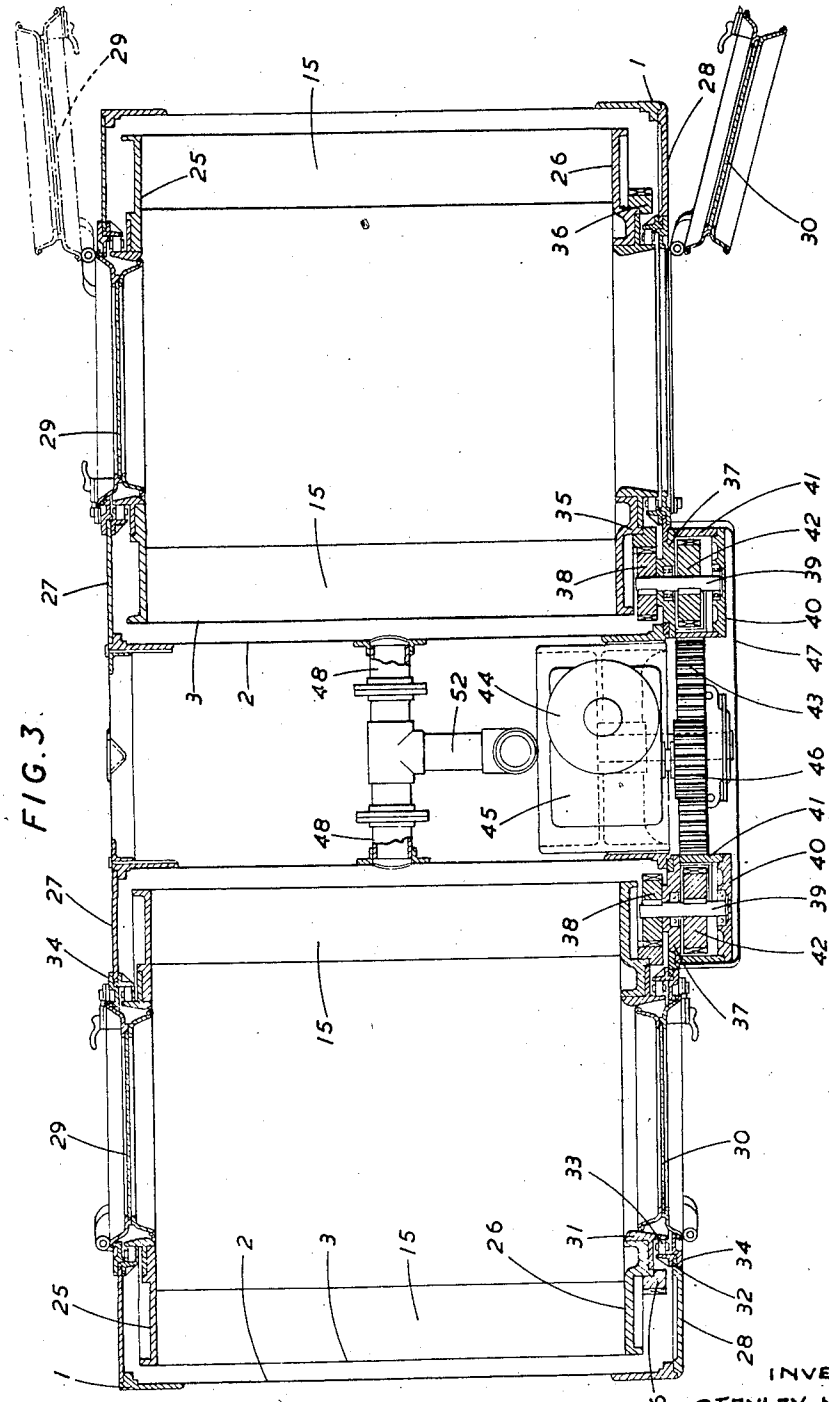

FIG. 3.

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MACHINE USED IN LAUNDRIES FOR WASHING OR DRYING ARTICLES

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Original application December 9, 1944, Serial No. 567,335. Divided and this application February 8, 1946, Serial No. 646,424. In Great Britain December 14, 1943

1 Claim. (Cl. 68—27)

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This invention, originally included in application Serial No. 567,335 of which the present application is a division, relates to improvements in machines used in laundries for washing or drying clothes and other articles, and is concerned with machines of the kind comprising a horizontally disposed cylindrical rotary cage or perforated inner drum revoluble in a fixed casing or outer drum, such cage being equipped with the usual internal ribs or beaters, and the said fixed outer drum and the cage having aligned apertures, closed by door means, affording access to the interior of the cage. Machines of this type when constructed for use in drying articles usually are known as tumblers.

A machine of the kind stated in the preceding paragraph is unloaded through the aligned apertures in one end of the fixed drum and the cage, the drum, in machines as heretofore constructed, being equipped with a door comprising or having associated with it a closure for the aperture in the cage.

Machines of the kind indicated have been constructed for washing purposes comprising a pair of cages disposed with their axes parallel, each cage having its own outer drum and the latter being mounted in a common main frame. Such machines are known as twin washers, and as heretofore constructed have had access openings at one end only of the machine.

It is the object of the invention to provide an improved construction of a twin machine which will enable loading and unloading to be effected in a manner such as to facilitate that progressive treatment of the work in the laundry, which is essential or very advantageous in obtaining the maximum output from the plant, and at the same time will have a balanced or symmetrical drive for the cages. Such improved twin machine may be either a washer or a tumbler.

According to the present invention, in order to facilitate the orderly progression of work through the series of treatments to which it is subjected in laundering, a twin machine is provided with door closed apertures at both ends enabling the machine to be loaded at one end and unloaded at the other, thus avoiding the liability of the operatives concerned with the transfer of the work from the machine to the next treatment being impeded by other operatives concerned with reloading the machine and by the presence of trolleys or other receptacles in which the fresh work for treatment in the machine has been conveyed to it.

A laundry machine according to this invention

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comprises, in combination, a main frame mounting a pair of drums, a pair of cages revolubly mounted in the respective drums with their axes horizontally and parallelly disposed, an access opening in each end of each cage, access openings in the drums similar to and in registration with those in the cages, doors effective to close fluid-tightly said openings in the drums and to substantially close the said openings in the cages, a ring gear within each drum fast with the respective cage and meshed within the drum with a driving pinion having its shaft journalled in a bearing carried by the drum, said gears and pinions being positioned to leave unobstructed the said access openings, and transmission gearing, including a main driving gear common to both cages, for driving the latter synchronously from a source of power.

In the accompanying drawings:

Fig. 1 is a part front elevation and part cross-section, and

Fig. 2 a part rear elevation and part cross-section, of a twin cage washing machine according to an embodiment of the invention, and

Fig. 3 is a sectional plan of the machine shown in Figs. 1 and 2, the section being taken on the line A—B of Fig. 2.

Referring to the drawings, the machine frame 1 carries a pair of outer drums 2, in each of which is mounted an inner perforated drum or cage 3. Each cage has end plates 25, 26 at its front and rear ends, respectively, the said end plates having circular access openings in them aligned with similar openings in the end plates 27, 28 of the drums 2, and doors 29, 30, hinged to the plates 27, 28, are adapted to close fluid-tightly the openings therein, and also substantially to close the openings in the end plates 25, 26 of the cages 3, while permitting the latter to rotate.

The cages are revolubly mounted by means of T-section rings 31 bounding the access openings in the end plates and providing cylindrical surfaces between which and cylindrical surfaces on rings 32 carried by the end plates 27, 28 of the drums 2 roller bearings 33 are interposed. The access openings in the end plates 27, 28 are bounded by rings 34, the various rings being secured to the respective plates by screws or the equivalent (not shown).

At the rear of the machine, the end plate 26 of each cage 3 has its marginal region set inwardly and on the annular portion or boss 35 of the plate a ring gear 36 is mounted and made fast to the plate. Between the marginal portion

of the cage end plate 26 and a removable closure plate 37 in an aperture in the end plate 28 of the drum is a driving pinion 38, the shaft 39 of such pinion being journalled in the plate 37 and also in a cover plate 40 of a housing 41 on the end plate 28, in which housing is a transmission pinion 42 meshed with a main driving gear 43, common to both cages.

The main driving gear 43 is driven from an appropriate source of power, but preferably as shown by an electric motor 44, through reduction gearing in a gear box 45 and the pinion 46. The common driving gear 43, the pinion 46, and the housings 41 are enclosed by a removable cover 47.

The spindle of the main driving gear 43 lies in the central longitudinal plane of the machine, and the arrangement of the gears 42 and pinions 38 provides a balanced or symmetrical drive.

As usual in washing machines and tumblers, the cages 3 are equipped with work lifting ribs or beaters 15.

As the machine shown is a washing machine, it is equipped with water supply connections 48, solution hoppers 49, and outlet or drain valves 50, the water supply connections 48 receiving hot or cold water from the respective one of pipes 51 through a common feed 52, the valves 53 controlling the water supplies being operable by levers 54 at the front of the machine. A vent 55 is provided for each drum 2, and the drums preferably are inter-connected at the bottom of the machine by a suitable cross pipe to maintain a common water level in the drums 56, Fig. 1, indicating the connection of such cross pipe to the box or casing of the drain valve 50 of the right hand drum. 57 is the steam supply pipe to the drums.

The solution hoppers may be individual to the drums or deliver to a cross feed common to the drums 58, Fig. 1, being the connection of the solution feed to the right hand drum of that figure.

In order to avoid the waste of water, steam and solution that would result from feeding the same to both drums or sections of the machine when the quantity of work to be treated is such that it can be dealt with in one cage only of the machine, valves are provided in the cross pipes or common feeds to the drums to isolate one section of the machine from the other, 59 being the isolating valves in the steam supply pipe 57.

It will be understood that in the case of a drying tumbler, the water, steam and solution feeds would be omitted, and a supply of heated air connected to the drums.

Conveniently the door fastenings at both ends of the machine would be arranged to actuate means controlling the operating power supply or be electrically or mechanically interlocked with the driving gear to ensure that all doors are closed and fastened before the machine can be started, but where the machine is to be unloaded by unloading means according to application Serial No. 567,335, provision would be made for slow rotation or "inching" of the cages with the unloading doors open.

Where the slow or unloading rotation of the cages of a machine is effected by power the machine preferably would be equipped with safety guards or fences to prevent the operator having access to the interiors of the cages whilst in motion, and such safety devices may interlock, in parallel with the doors, with the power supply or driving gearing, to prevent the cages being rotated with any door open except with the safety means in position. Similarly there preferably would be associated with the doors and safety guards or fences fastening means whereby until the power is cut off from the machine a closed door could not be opened or a safety guard removed.

What I claim is:

A laundry machine of the kind set forth, comprising in combination a main frame mounting a pair of drums with their axes horizontal and parallelly disposed, an access aperture in each end of each drum, a cage with an access aperture in each end revolubly mounted in each drum with its said apertures concentric with the periphery of said cage and aligned with the respective apertures in such drum, a door at each end of each drum operative to close fluid-tightly the aperture in said end and also to substantially close the aligned aperture in the respective cage while permitting the latter to rotate, bearing rings fast with the end walls of said drums and cages and surrounding the access apertures therein, antifriction bearings between said rings at each end of each cage, a main driving shaft rotated by a source of power, a ring gear fast with each cage and disposed within the respective drum concentric with the cage and surrounding its respective bearing rings, a driving pinion in each drum meshed with the respective ring gear and having its driving shaft extending outside the drum through a bearing in the respective end wall thereof, said ring gears and driving pinions being positioned to leave unobstructed the said access openings, and a main driving gear common to the said cages and arranged externally of the drum at one end of the machine with its axis horizontally disposed in the central longitudinal vertical plane of the machine, said main gear being driven by said main driving shaft through reduction gear and being operative to drive the shafts of said driving pinions meshed with the ring gears through transmission gears fast with said shafts.

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