

ROLLER SHUTTERS OR CURTAINS

This invention relates to roller shutters or curtains.

Roller shutters or curtains are known to be formed from articulated laths attached at one or both ends to a respective conveyor chain, with the or each conveyor chain  
5 lying in a guide. Such shutters or curtains can be mounted either vertically or horizontally.

Opening or closing of the shutters or curtains is ordinarily effected by winding the shutter or curtain on to or from a roller, driven from an appropriate drive means in  
10 the opening and closing directions. Hitherto, and to prevent the articulated laths from buckling and not being wound properly on to the roller during the opening of the shutter or curtain, it has been felt necessary to spring load the roller in the direction of rotation to wind the shutter or curtain on  
15 to it. The result of this is that during the closing of the shutter or curtain, the unwinding of the shutter or curtain from the roller progressively increases the spring loading on the roller, to such a degree that a considerable drive force is required to be applied to unwind the shutter or curtain to  
20 its full required extent.

It is the object of the invention to provide a roller shutter or curtain that avoids these disadvantages mentioned above.

According to the present invention, a roller shutter  
25 or curtain comprises a roller, a drive means for the roller to wind the shutter or curtain on to the roller, a conveyor means for the shutter or curtain, a guide means for the shutter or

curtain, a drive means for the conveyor means to draw the shutter or curtain from the curtain roller, said respective drive means being selectively activatable to wind the shutter or curtain on or draw the shutter or curtain from the roller, 5 said drive means for said roller being positively rotated in a direction to wind the shutter or curtain on the roller, and which freewheels when its drive is deselected and the roller is caused to rotate in the opposite direction during drawing of the shutter or curtain from the roller, said drive means 10 for said conveyor means being positively rotated in a direction to draw the shutter or curtain from the roller and which freewheels when its drive is deselected and is caused to rotate in the opposite direction during winding of the shutter or curtain on to the roller, and there being respective brake 15 means associated with the roller drive means and the conveyor drive means to retard their rotation particularly when in their freewheel condition.

Thus, to close the shutter or curtain, the drive roller is driven and acts on the conveyor means to draw the 20 shutter or curtain from the curtain roller, the clutching mechanism allowing the curtain roller to freewheel. In this condition the brake means associated with the curtain roller retards rotation of the curtain roller to maintain the shutter or curtain in position on the curtain roller and prevent 25 overtravel. To open the shutter or curtain, it is the curtain roller that is driven to wind the shutter or curtain on to it, and the drive roller that is allowed to freewheel by the clutching mechanism, and the brake means associated with the

drive roller activated to retard rotation of the drive roller. This results in a tension applied to the conveyor means as it is wound on to the curtain roller to ensure correct wrapping of the shutter or curtain on to the curtain roller.

- 5           In relatively conventional manner, the shutter or curtain may be formed from articulated laths attached to a conveyor chain at one or both sides, with the or each conveyor chain lying in a guide and extending to the curtain roller.

Here, the drive roller may have drive sprocket to engage the links of the conveyor chain, and where two conveyor chains are provided, a drive roller and sprocket provided for each chain.

5 Preferably, a common drive means is provided for the curtain and drive rollers. Thus, two drive sprockets may be provided, on a common drive shaft suitably attached to a drive motor. Each drive sprocket is provided with clutch means to enable it to be driven in one direction and freewheel in the other, and each drive sprocket is suitably connected to its  
10 respective curtain roller or drive roller by such as a drive chain.

The brake means associated with the curtain roller and the drive mechanism may simply be a band of a suitable friction material extending from an anchor point to one side  
15 of a brake drum located on the respective shafts of the curtain and drive mechanisms around the brake drum and to an anchor point to the opposite side of the brake drum, the band being attached to the anchor to one side of the brake drum via a spring. Preferably, the connection of the band to its  
20 anchor to the opposite side to the spring includes an adjustment means to vary the loading of the band against the respective drum.

One embodiment of the invention will now be described by way of example only, with reference to the accompanying  
25 drawings, in which:-

Figure 1 is a schematic side elevation of a roller shutter or curtain according to the invention; and

Figure 2 is a schematic side elevation of a brake

mechanism associated with the curtain and the drive roller.

In relatively conventional manner the articulated laths of a roller curtain or shutter (omitted for clarity) are attached at at least one side to a conveyor chain 1 lying in a guide 2, the end of the chain being attached to a curtain roller 3, and on to or from which the conveyor chain and the curtain or shutter can be wound.

As is shown by Figure 1, power to drive the curtain roller to wind the curtain or shutter on to it during opening of the curtain or shutter is provided by a motor 4 having a drive chain 5 extending to a sprocket wheel on a sprocket arrangement 6, and a further drive chain 7 extending from a further sprocket wheel on the sprocket arrangement to the drive shaft 8 of the curtain roller. Coaxially mounted on the drive shaft 8 is a brake drum 9 around which extends a band 10 of friction material, one end of the band being attached to an anchor plate 11 via a spring 12, and the other end of the band attached to the anchor plate 11 via an adjusting mechanism 13 and whereby the loading of the band 10 against the drum 9 can be varied.

Extending from a respective sprocket on the sprocket arrangement 6 is a still further drive chain 14 engaging a drive sprocket 15 for the conveyor chain 1, and to be driven by the motor 4 in the opposite direction. Coaxially mounted on the drive sprocket 15 is a brake drum 16, around which extends a friction band 17, attached by one end to an anchor plate 18 via a spring 19, and by its other end to the anchor plate 18 by an adjusting mechanism 20 to vary the loading of

the band 17 on the drum 16.

The arrangement of the sprockets on the sprocket arrangement 6 is such that the sprockets for the chains 7 and 14 are mounted to be driven with the sprocket for the chain 5 in one direction and freewheel in the opposite direction. Thus, when the curtain roller 3 is driven, the drive sprocket 15 for the conveyor chain is in a freewheel condition, and when the drive sprocket 15 is driven the curtain roller is in a freewheel condition, but both are restrained by the brake mechanisms associated with them.

As a result, when the drive sprocket 15 is driven to close the curtain or shutter, the curtain or shutter is unwound from the curtain roller 3 under a constant force provided by the brake mechanism in the curtain roller 3, and similarly when the curtain roller is driven to wind the curtain or shutter on to it, it is under a constant force provided by the brake mechanisms. It will be understood that the force provided need not be excessive but sufficient to hold the curtain taut between the curtain roller 3 and the drive sprocket 15, and to prevent overtravel of either when in their freewheel condition, and hence ensure correct winding and unwinding on to or from the curtain roller with the substantial elimination of the risk of the laths buckling.

Conveniently the curtain roller 3, drive sprocket 15, sprocket arrangement 6, and motor 4, are contained in a housing 16.

CLAIMS

1. A roller shutter or curtain comprising a roller, a drive means for the roller to wind the shutter or curtain on to the roller, a conveyor means for the shutter or curtain, a guide means for the shutter or curtain, a drive means for the conveyor means to draw the shutter or curtain from the curtain roller, said respective drive means being selectively activatable to wind the shutter or curtain on or draw the shutter or curtain from the roller, said drive means for said roller being positively rotated in a direction to wind the shutter or curtain on the roller, and which freewheels when its drive is deselected and the roller is caused to rotate in the opposite direction during drawing of the shutter or curtain from the roller, said drive means for said conveyor means being positively rotated in a direction to draw the shutter or curtain from the roller and which freewheels when its drive is deselected and is caused to rotate in the opposite direction during winding of the shutter or curtain on to the roller, and there being respective brake means associated with the roller drive means and the conveyor drive means to retard their rotation particularly when in their freewheel condition.

2. A roller shutter or curtain as in Claim 1, wherein the conveyor means for the shutter or curtain is a conveyor chain to which the shutter or curtain is attached, said conveyor chain lying in a chain guide.

3. A roller shutter or curtain as in Claim 1 or Claim



2, wherein the drive mechanism for the conveyor chain is a drive sprocket.

4. A roller shutter or curtain as in any of Claims 1 to 3, wherein a common drive means is provided to the curtain roller and the drive mechanism.

5. A roller shutter or curtain as in Claim 4, wherein a drive motor is provided with a drive chain extending to a drive sprocket on a sprocket arrangement, the arrangement having two further sprockets one for each respective drive chain to the curtain roller and to the drive mechanism for the conveyor chain, each said further sprocket having a clutch to allow a positive rotation with the drive socket in one direction and allow free rotation in the opposite direction.

6. A roller shutter or curtain as in any of Claims 1 to 5, wherein the brake means associated with the curtain roller and the drive mechanism is a band of a suitable friction material extending from an anchor point to one side of a brake drum located on the respective shafts of the curtain and drive mechanisms around the brake drum and to an anchor point to the opposite side of the brake drum, the band being attached to the anchor to one side of the brake drum via a spring.

7. A roller shutter or curtain as in Claim 6, wherein the connection of the band to its anchor to the opposite side to the spring includes an adjustment means to vary the loading of the band against the respective drum.

8. A roller shutter or curtain as in Claim 6, substantially as hereinbefore described with reference to the



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accompanying drawings.

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