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ADJUSTABLE CAM MECHANISM

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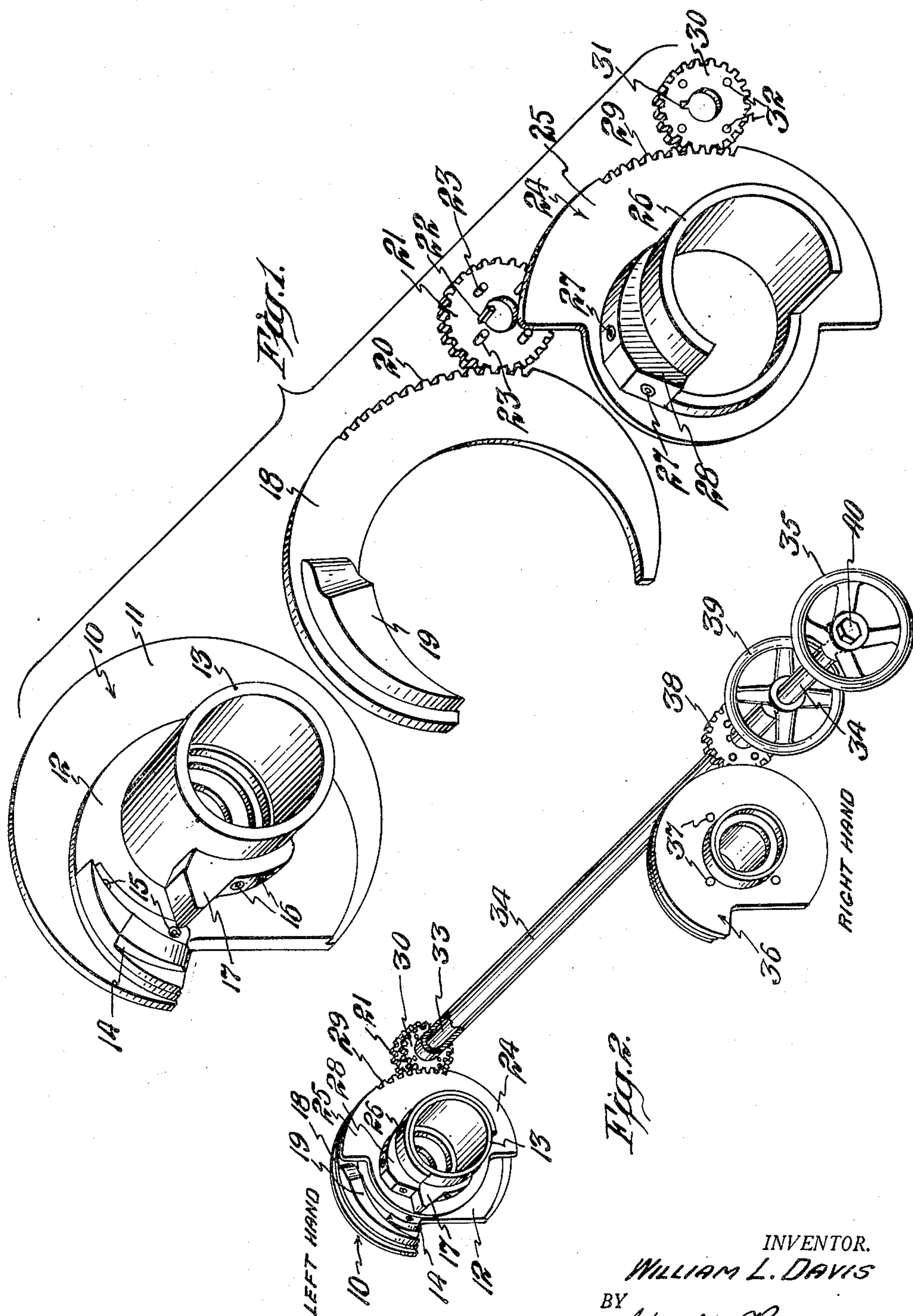


Fig. 2.

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## ADJUSTABLE CAM MECHANISM

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The present invention relates to improvements in adjustable cam mechanism. More particularly it pertains to a cam mechanism by which varying axial and radial movements may be obtained in a machine, and the invention is particularly applicable to the opening cylinder assembly on paper bag making machines.

In paper bag making machines it is necessary in the opening cylinder assembly to vary the axial and radial movements for different size bags. Such movements are obtained by means of similar cams on each side of the machine. To make adjustments in these cams it is common practice either to change the cam itself or to make a complicated adjustment of the cam position, with the result that there is a long shutdown time required during the change-over from one bag size to another.

The present invention provides an adjustable cam mechanism which simplifies the adjustment of the cams, provides a more accurate means of setting the right- and left-hand cams in the same relative position, and gives far less trouble than the present cam adjustments. Furthermore it is possible with the present invention to adjust the right- and left-hand cams either separately or together while the bag machine is running, thereby insuring the proper setting of the cams under operating conditions and overcoming the necessity of constantly stopping and starting the machine until the proper setting has been achieved.

A general object of the present invention is to provide a cam mechanism which is not only simple to adjust but is also easy to install on a machine, such mechanism being economic of manufacture and well suited to the purposes for which it is intended.

More specifically, it is an object of the present invention to provide a cam mechanism having a stationary cam mount on which are mounted the fixed portion of an axial cam and the fixed portion of a radial cam, an adjustable axial cam mount on which is mounted the adjustable portion of the axial cam, an adjustable radial cam mount on which is mounted the adjustable portion of the radial cam, and means for rotating the adjustable cam mounts and the portions of the cams mounted thereon.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and

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the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view showing the component parts which make up the cam of the present invention;

Figure 2 is a perspective view showing right- and left-hand cam mechanisms embodying the present invention as the same would be used in conjunction with a paper bag making machine.

In the following description my invention is particularly described in connection with the right- and left-hand cam mechanisms which would be used in connection with a paper bag making machine, but it will be understood that this is merely for the purpose of illustration and that the invention is applicable to various machines and that the cam mechanism and the adjustment therefore may also be used singly.

Referring more particularly to the drawing, there is shown in Figure 1 a stationary cam mount 10 having a plate portion 11, a raised plate portion 12 and a cylinder portion 13. The fixed portion 14 of an axial cam is mounted on the raised plate portion 12 by means of screws 15. Mounted on the cylinder portion 13 by means of screws 16 is the fixed portion 17 of a radial cam.

Further referring to Figure 1 there is also shown an adjustable axial cam mount 18 on which is mounted the adjustable portion 19 of the axial cam. This adjustable cam mount 18 is provided with a toothed section 20 which is adapted to engage a gear 21. This gear is provided with a key 22 for keying the gear to a shaft and pins 23 for fastening together the gears which engage the adjustable cam mounts.

In Figure 1 there is further shown an adjustable radial cam mount 24 consisting of a plate 25 and a sectioned cylinder 26. Mounted on this sectioned cylinder by means of screws 27 is the adjustable portion 28 of the radial cam. This cam mount 24 is provided with a toothed section 29 adapted to engage a gear 30 which gear is provided with a slot 31 to receive the key 22 and holes 32 to receive the pins 23.

In Figure 2 the cam mechanisms of the present invention are shown as they would be mounted on the right- and left-hand sides of a paper bag making machine, so that the same axial and radial movements can be obtained simultaneously in the opening cylinder assembly of the machine.



The left-hand cam mechanism shows the component parts of Figure 1 assembled in operating condition. The adjustable axial cam mount 18 slidably fits over and around the raised plate portion 12 of the stationary cam mount 10 and the adjustable portion 19 of the axial cam mounted on the cam mount 18 engages the fixed portion of the axial cam 14 mounted on the cam mount 10. By rotating the adjustable cam mount and the portion mounted thereon with respect to the fixed portion of the axial cam it is possible to obtain varied axial movements by means of the axial cam. Likewise, the adjustable radial cam mount 24 is fitted against the stationary cam mount 10 and the adjustable axial cam mount 18. Before this radial cam mount 24 can be slid into position, screws 16 and the fixed portion of the radial cam 17 must be removed from the cylinder portion 13, after which the sectioned cylinder 26 of the radial cam mount 24 can be slid into position over the cylinder portion 13, and the fixed portion 17 of the radial cam mount and screws 16 can be replaced. The three cam mounts are thus held in position. With the radial cam mount 24 in position the adjustable portion 28 of the radial cam engages the fixed portion of the radial cam so that a rotation of this radial cam mount and the cam portion mounted thereon will give varied radial movements by means of the radial cam.

The gears 21 and 30 which engage the two toothed sections of the adjustable cam mounts are pinned together and keyed to a shaft 33. This shaft is carried through a tube 34 and on the end of the shaft and keyed thereto is a hand wheel 35 so that it is possible to rotate the hand wheel and simultaneously vary the axial and radial cams. Since the cam mechanism illustrated by the drawings is shown as it would be used in connection with the opening cylinder assembly of a paper bag machine, the gears 21 and 30 are of different diameter and vary as to the number of teeth. This permits the axial cam and the radial cam to be varied with respect to each other in a predetermined ratio merely by turning the hand wheel 35. It will be understood that the gears may be of the same diameter, have the same number of teeth, or may be varied in both respects without changing the principle of operation of the present invention.

The right-hand cam mechanism illustrated in Figure 2 is the same in all respects as the left-hand cam mechanism above described. Viewing the right-hand mechanism the stationary cam mount 36, corresponding to the stationary cam mount 10, shows tapped holes 37 which are provided in both stationary cam mounts for affixing them to a frame or other support. To rotate the adjustable cam mounts for the right-hand mechanism there is a gear 38 corresponding to the gear 21 and a gear (not shown) corresponding to the gear 30. These gears are likewise pinned together as above described and are keyed to the tube 34. There is securely affixed to the tube 34 a hand wheel 39 so that the axial and radial cams of the right-hand mechanism can be adjusted by rotating the hand wheel 39.

The end of the shaft 33, to which is keyed the hand wheel 35, is threaded and bears a nut 40. The hub of the hand wheel 35 butts against the tube 34. Since the hand wheel 35 is slidably keyed to the shaft it is possible by means of the nut 40 to tighten the wheel 35 against the tube 34 so that both wheels are locked together and the cams on both the right and left can thereby be adjusted simultaneously by the rotation of the outer hand

wheel 35. If the nut 40 is loosened and the hand wheels are not locked together in position it is possible to adjust each mechanism independently of the other.

While I have illustrated one particular embodiment of my invention and one particular application thereof, it will be understood that various changes and modifications may be made therein and the invention may be used in connection with various types of machines where variations in the axial and radial movements are required.

It will thus be seen that the objects herein set forth may readily and efficiently be attained and since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, a cam mount supporting the fixed portions of the axial and radial cams, rotatable cam mounts supporting the adjustable portions of the axial and radial cams and means for moving the rotatable cam mounts and the portions of the cams mounted thereon.

2. A cam mechanism comprising a cam mount on which is mounted a portion of an axial cam and a portion of a radial cam, an adjustable axial cam mount on which is mounted another portion of the axial cam, an adjustable radial cam mount on which is mounted another portion of the radial cam, and means for rotating the adjustable cam mounts and the portions of the cams mounted thereon.

3. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, said cams being in juxtaposition and having the same axis, cam mounts supporting the adjustable portions of the axial and radial cams, and means for rotating the said cam mounts and the portions of the cams mounted thereon.

4. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, a cam mount supporting the fixed portions of the axial and radial cams, rotatable cam mounts supporting the adjustable portions of the axial and radial cams and provided with toothed sections, gears engaging the toothed sections of the rotatable cam mounts, and a shaft affixed to said gears, whereby the axial and radial cams may be varied by rotating the shaft.

5. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, said cams being in juxtaposition and having the same axis, cam mounts supporting the adjustable portions of the axial and radial cams and provided with toothed sections, coacting gears engaging the toothed sections, so constructed that the cam



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mounts and portions of the cams mounted thereon may be rotated in a predetermined ratio.

6. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, said cams being in juxtaposition and having the same axis, cam mounts supporting the adjustable portions of the axial and radial cams and provided with means for rotating the cam mounts and the portions of the cams mounted thereon, said rotating means being interconnected and having a predetermined ratio, whereby the axial and radial cams may be varied simultaneously in a predetermined ratio.

7. A cam mechanism comprising an axial cam having fixed and adjustable portions, a radial cam having fixed and adjustable portions, said cams being in juxtaposition and having the same axis, cam mounts supporting the adjustable portions of the axial and radial cams and provided

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with toothed sections, gears engaging the toothed sections, said gears being interconnected and having a predetermined ratio, means for rotating said gears, whereby the axial and radial cams may be varied simultaneously in a predetermined ratio.

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