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Madison

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[54] **POWERED TYPE ACTION WITH A CAM ARRESTOR**

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[52] **U.S. Cl.** **197/16,** 197/17

[51] **Int. Cl.** **B41j 23/08**

[58] **Field of Search** 197/17, 64, 16

[56] **References Cited**

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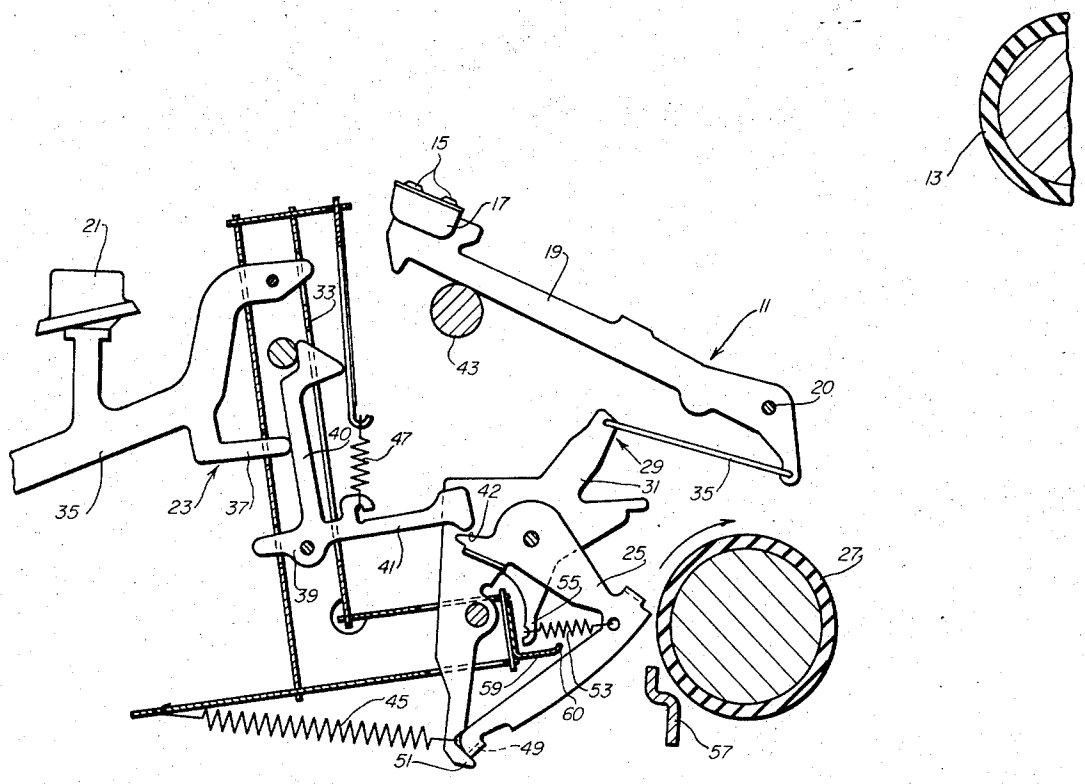
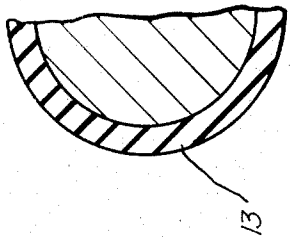
[57] **ABSTRACT**

A type action, which is driven by a cam engaging a rotatably driven power roll, is provided with a cam arrestor for preventing the cam from returning directly to a rest position where it would normally bounce off a stop formed in a type linkage and possibly reengage the power roll to cause an unintended repeated operation of the type action.

4 Claims, 2 Drawing Figures

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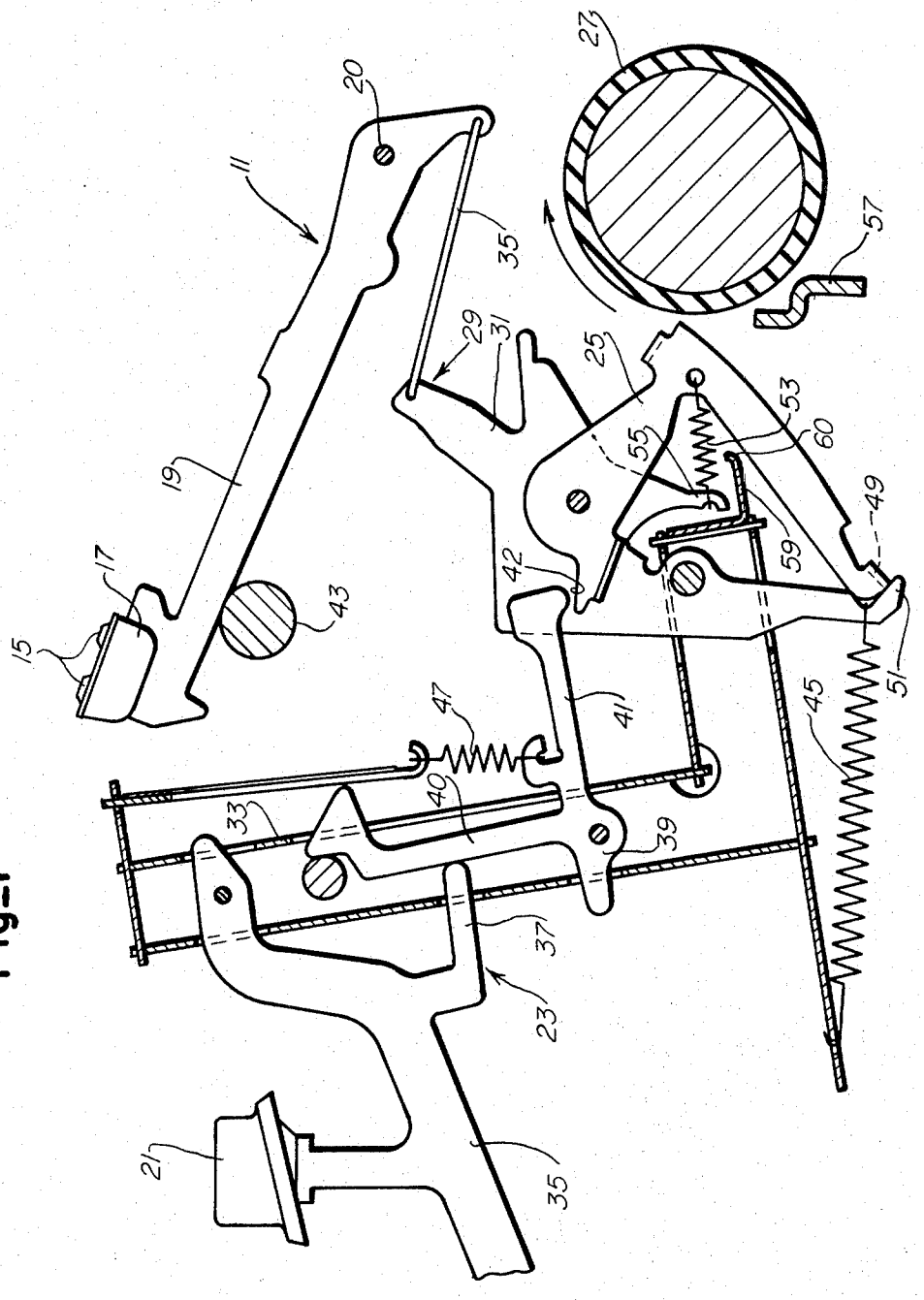
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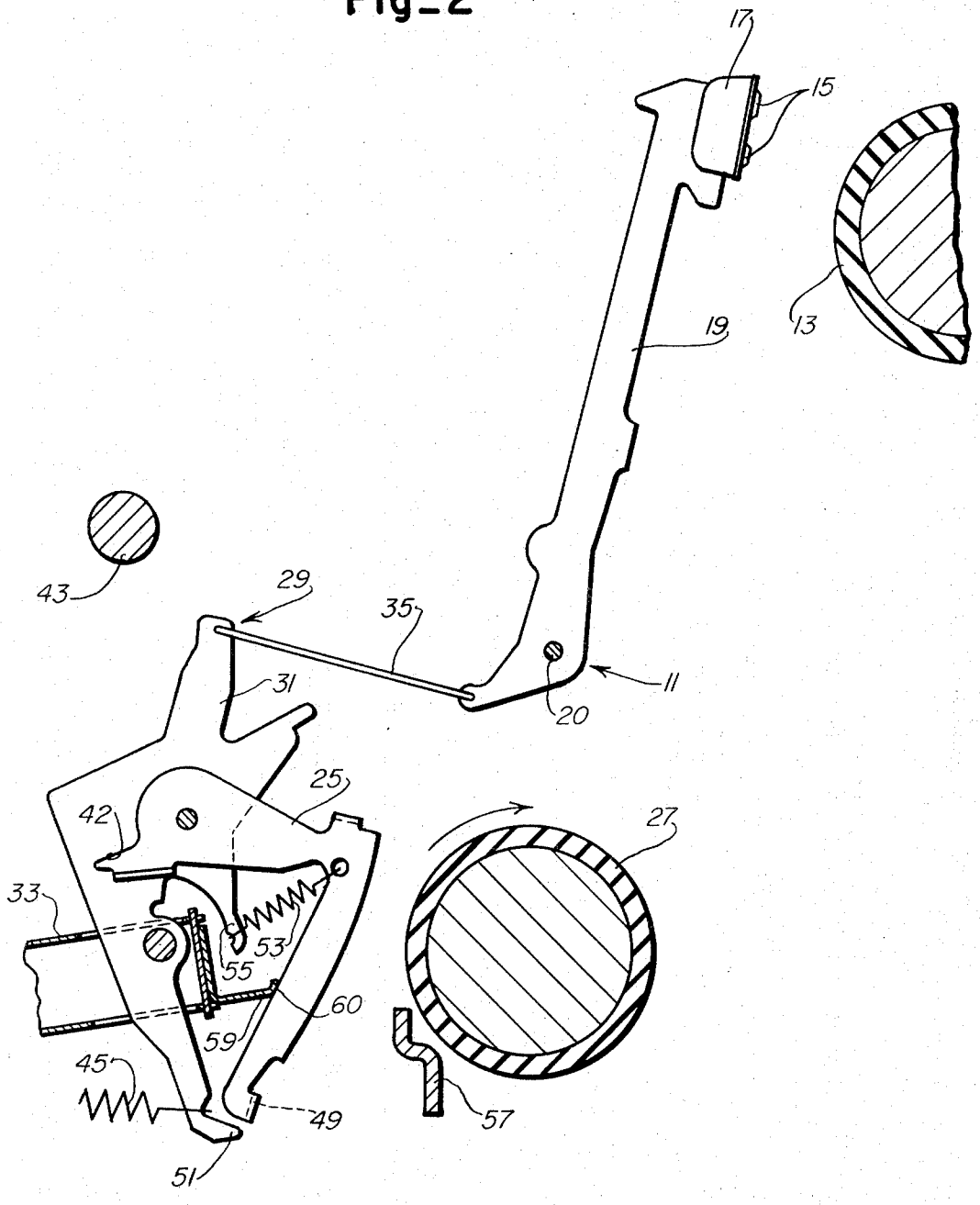
Fig_1

Fig_2



POWERED TYPE ACTION WITH A CAM ARRESTOR

This invention relates to a powered type action which is driven in a printing operation by a cam engaging a rotatably driven power roll, and more particularly to an improved type action for minimizing the effect of the cam bouncing against a linkage in the type action after disengagement from the power roll.

In a power driven typewriter having a type action which is driven by a cam moving in engagement with a rotatably driven power roll, the cam is usually pivotably supported on a type linkage in the type action and spring biased toward a rest position against a stop formed in the type linkage. When the type action is operated to effect a printing of a type character on a recording medium located at a printing position, the cam is moved into engagement with the rotating power roll so as to drive the type linkage in a printing operation as the cam moves past the power roll. After moving past the power roll, the cam is returned to the rest position where it strikes the stop formed on the type linkage and bounces toward the power roll. The bouncing of the cam against the stop often occurs several times before the cam finally comes to rest.

In the past, the bouncing of the cam against the type linkage has not presented a serious problem in the operation of a typewriter, because the type action was sufficiently slow in returning from a printing position as to enable the cam to come to rest before the type action became conditioned for another printing operation. However, when the speed of the type action in returning from the printing position is substantially increased, the bouncing of the cam becomes a serious problem because it may again engage the power roll and cause an unintended repeated operation of the type action. In addition, it is believed that the cam may strike the type linkage simultaneously with the impacting of the type character against the recording medium and cause the printed character to be blurred. Moreover, the repeated striking of the cam against the stop formed in the type bar linkage eventually results in the breakage of the stop and necessitates the replacement of the type linkage.

Accordingly, an object of the present invention is to provide an improved type action which prevents the cam from bouncing into engagement with the power roll and causing an unintended repeated operation of the type action.

Another object of the invention is to provide an improved type action which prevents the bouncing of the cam from interfering with the quality of the printed type character.

A further object of the invention is to provide an improved type action which prevents breakage of the type bar linkage resulting from repeated bouncing of the cam.

Still other objects, features and advantages of the present invention will become apparent to those skilled in the art from a reading of the following detailed description of a preferred embodiment of the invention, taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a diagrammatic side view of a type action constructed in accordance with the present invention; and

FIG. 2 is a partial view of the type action of FIG. 1 and illustrates the condition of the type action prior to the type bar impacting against the platen.

Referring now in detail to the figures in the drawing, there is shown a type action, generally indicated at **11**, for printing type characters or other symbols on a recording medium, not shown, which may desirably be located on a platen **13**. The type characters **15**, or other symbols to be printed are formed on a type head **17** which is carried on the end of a type bar **19**, and the type bar **19** is supported for a printing movement from a rest position to the platen **13**. As is conventional, printing is effected by impacting the type character **15** against the recording medium, and the type bar **19** is driven in a printing movement to the printing position by depressing a type key **21** located on a keyboard, not shown, to cause a key actuating means, generally indicated **23**, to move a cam **25** into engagement with a power roll **27** which may desirably be rotatably driven by a motor, not shown. The cam **25** is pivotably supported on a type bar linkage, generally indicated **29**, and drives the type bar **19** to the printing position as the cam **25** moves in engagement with the rotating power roll **27**. The recording medium, the keyboard, and the motor for driving the power roll **25** as well as other portions of the typewriter are not shown since they form no part of the present invention and may be desirably conventional.

As shown, the type bar **19** is pivotably supported about a segment wire **20**, as is conventional, and is driven by the cam **25** through the type bar linkage **29** which includes a sublever **31** which is pivotably supported on a mounting bracket **33** and connected to the type bar **19** by a link **35**. The type key **21** for operating the key actuating means **23** is supported on a keylever **35** which is pivotably supported on the mounting bracket **33** and has a projecting finger **37** for rocking an L-shaped intermediate lever **39** which is also pivotably supported on the mounting bracket **33**. The L-shaped intermediate lever **39** has one arm **40** which is contacted by the finger **37** while the end of the other arm **41** contacts a shoulder **42** of the pivotably supported cam **25** for moving it into engagement with the power roll **27**.

In the rest position, the type bar **19** is normally urged against a headrest **43** by a resilient biasing means in the form of a return spring **45** which is stretched between the sublever **31** and a suitable portion of the mounting bracket **33**, and the type key **21** on the keylever **35** is normally maintained in a raised position by another resilient biasing means pressing the L-shaped lever **39** against the keylever **35**. As shown in FIG. **1**, the other resilient biasing means is in the form of another spring **47** which is stretched between the arm **41** of the intermediate lever **39** and a suitable portion of the mounting bracket **33** so as to urge the other arm **40** against the projecting finger **37** of the keylever **35**. To insure that the type key **21** is raised to the same level as other type keys on the keyboard, the mounting bracket **33** is provided with a stop abutment **44** for limiting the movement of the arm **40** of the intermediate lever **39** under the urging of the spring **47**. To insure that the type key **21** undergoes the same depression each time the type action **11** is operated, the cam **25** has a rearward portion **49** which is urged against a stop **51** formed on the end of the sublever **31** by another resilient biasing means in the form of a spring **53** which is stretched be-

tween the cam 25 and a suitable projecting portion 55 of the sublever 31.

When the type key 21 is depressed to initiate the operation of the type action 11, the keylever 35 is pivoted downwardly to rock the intermediate lever 39 clockwise and pivot the cam 25 into engagement with the rotatably driven power roll 27. As the cam 25 is driven upwardly by frictional engagement with power roll 27, the sublever 31 is driven rearwardly away from the power roll 27 and against the urging of the spring 45 so as to pivot the type bar 19 from the rest position and toward the printing position at the platen 13. The driving movement of the cam 25 continues until the rearward end 49 of the cam 25 engages an impression control bail 57, whereupon the cam 27 returns toward the stop 51 under the urging of the spring 53 while the momentum of the type bar 19 continues to move it toward the platen 13 and move the sublever 31 further from the power roll 27.

In accordance with the present invention, the returning cam 25 is prevented from striking the stop 51 on the sublever 31 by means of a cam arrestor 59 which blocks the path of the returning cam 25 while the sublever 31 is driven rearwardly from the power roll 27. As more particularly shown in FIG. 2, the cam arrestor 59 has a generally L-shaped cross-sectional configuration which is secured to the mounting bracket 33 and has a curved lip 60 formed on an edge extending forwardly into the path of the returning cam 25 so as to be struck prior to the impacting of the type head 17 against the platen 13. Since the cam 25 strikes the cam arrestor 59 instead of the stop 51, the associated vibrations are transmitted through the mounting bracket 33 instead of the type action 11 so as to avoid any undesirable effects on the printing action. Upon initially striking the cam arrestor 59, the cam 25 bounces toward the power roll 27 but does not contact it because of the rearward movement of the sublever 31. After the initial bouncing of the cam 25, the type bar 19 impacts against the platen 13 and returns toward the rest position under the urging of the return spring 45 which also moves the sublever 31 forwardly toward the power roll 27. At the same time, the cam 25 again engages the curved lip 60 of the cam arrestor 59 and gradually comes to rest against the stop 51 without any subsequent bouncing which could cause an unintended repeated operation of the type action 11.

I claim:

1. In a type action having a type bar linkage pivotally supported on a bracket for a printing movement from a rest position to a print position for moving a type bar in a printing operation to impact a type character thereon against a platen, a cam pivotally supported on the type bar linkage and resiliently urged to a rest position with a portion thereof contacting a stop formed on the type bar linkage, and the cam being selectively movable into engagement with a rotatable power roll for driving the type bar linkage in a printing movement and being removed from engagement with the power roll and returned toward the rest position during continued movement of the type bar linkage toward the print position, the improvement comprising:

a cam arrestor fixedly located adjacent said pivotally supported type bar linkage and positioned to permit said portion of said cam to contact said stop with said type bar linkage in the rest position and prevent said cam from contacting said stop upon returning toward the rest position during continued movement of said type bar linkage toward the print position.

2. In a type action according to claim 1, said cam arrestor being secured to said bracket supporting said type bar linkage.

3. In a type bar linkage according to claim 1, said cam arrestor being positioned for engagement by said returning cam prior to the movement of said type bar linkage to the print position.

4. In a type action according to claim 3, said cam arrestor being secured to said bracket supporting said type bar linkage.

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