July 18, 1967 M. V. SCOZZAFAVA 3,331,949

REPEAT MECHANISM FOR CALCULATING MACHINE

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FIG. 1

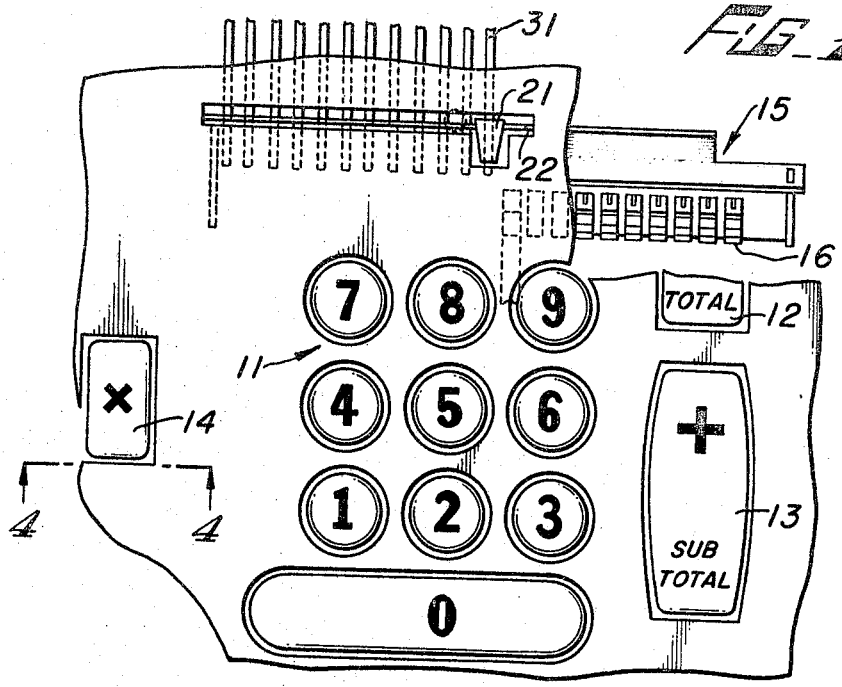


FIG. 4

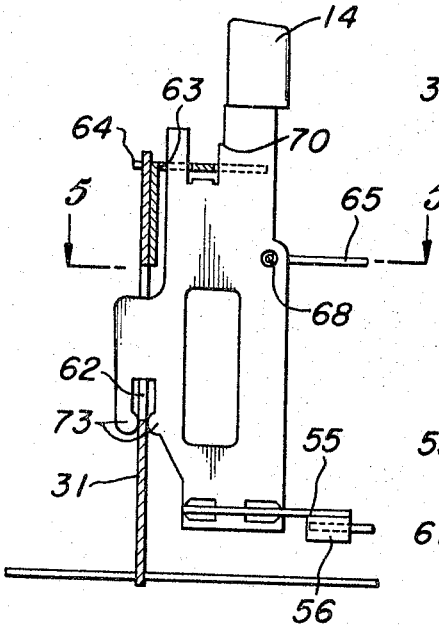


FIG. 5

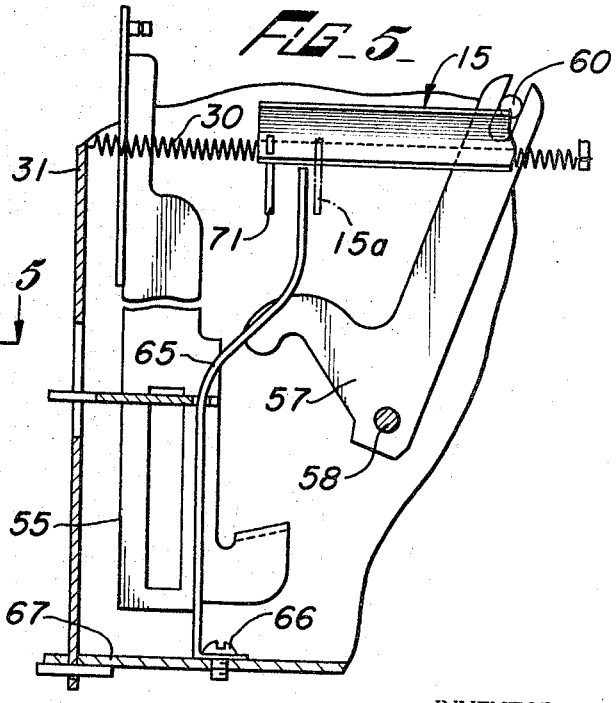


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FIG. 2

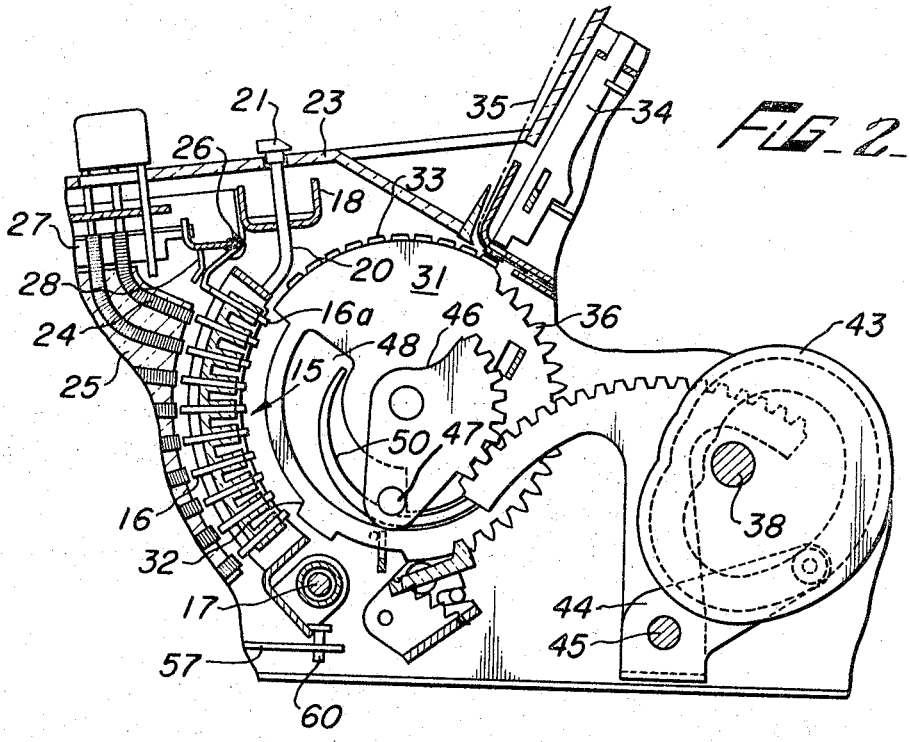
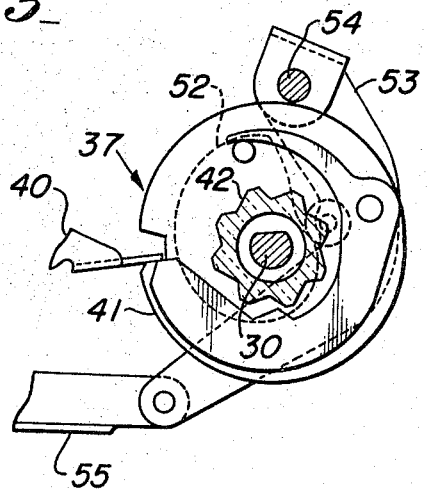



FIG. 3

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# REPEAT MECHANISM FOR CALCULATING MACHINE

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6 Claims. (Cl. 235—60)

This invention relates to cyclically operable adding and calculating machines and has particular reference to ten key machines of this type employing settable repeat mechanism for causing repetitive entries of amounts.

As is well known, ten key machines employing settable repeat control mechanism can be readily used to perform repeat and multiplying operations. In such cases, an amount or multiplicand is entered into the pin carriage or its equivalent and the repeat mechanism is set to prevent automatic restoration of the pin carriage during or at the end of each cycle. At the completion of the repeat or multiplying operation, however, the repeat mechanism must be released from set condition and the pin carriage must be restored to non-indexed condition so that succeeding calculating operations may be performed in the normal manner.

Quite often, in operating machines of the above type the operator may forget to release the repeat mechanism from set condition after performing a repeat or multiplying operation and therefore the machine will continue to perform repeat operations even though it may be desired to thereafter have items cleared from the pin carriage at the end of each cycle.

It therefore becomes the principal object of the present invention to obviate the above noted difficulty when operating a machine of the above type.

Another object is to automatically release a settable repeat mechanism from set condition upon restoration of the pin carriage to non-indexed condition.

A further object is to provide a simple and reliable mechanism for returning a settable repeat key or the like from set condition as an incident to restoration of a pin carriage from indexed condition.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification when read in conjunction with the accompanying drawings, wherein:

FIG. 1 is a plan view, with parts broken way, of a ten key adding machine embodying a preferred form of the present invention.

FIG. 2 is a sectional elevational view, with parts broken away, of the machine.

FIG. 3 is a sectional view illustrating the cyclic clutch and part of the pin carriage return mechanism.

FIG. 4 is a sectional view taken substantially along the line 4—4 of FIG 1, illustrating the settable repeat key.

FIG. 5 is a sectional plan view taken along the line 5—5 of FIG. 4.

Describing the illustrated embodiment of the invention in detail, the machine in which the embodiment is disclosed is the well known commercially available Addmaster Adding Machine whose various operating instrumentalities are basically disclosed in Patent No. 3,113,719, issued to R. E. Busch on Dec. 10, 1963 and Patent No. 3,132,582, issued to H. L. Clary et al. on May 12, 1964.

The machine is controlled by a ten key keyboard generally indicated at **11**, a minus-total key **12**, a plus-subtotal key **13** and a settable repeat key **14**.

An arcuate pin carriage **15** carrying a plurality of settable stop pins **16** is guided for movement transversely of the machine on a guide rod **17** adjacent the lower end thereof and by a slotted frame member **18** adjacent its upper end. An arm **20** extending upward from the pin carriage frame is guided in a slot in the member **18** and terminates in a knob **21** which extends through a slot **22** in the machine cover **23**, permitting the pin carriage to be manually returned to the right to its illustrated non-indexed or home position.



The pins **16** are arranged in a plurality of vertical rows, each row comprising ten such pins ranging in value from 0 to 9.

Each of the ten amount keys is suitably mounted for vertical movement and is connected to a respective flexible cable **24** guided for endwise movement in a guide block **25** suitably secured below the keyboard. All the cables **24** are located in a vertical plane which lies coincident with the lefthand row of stop pins **16** when the pin carriage is in its home position shown in FIG. 1.

The upper pins **16***a*, when set, enable incremental escapement of the pin carriage to the left as an incident to depression of each of the keys and for this purpose the leftmost upper pin normally rests against a fixed stop **26**. When any key is depressed it operates through its respective cable **24** to set an aligned stop pin **16** and at the same time it actuates a universal plate **27** which cooperates with a bail **28** to set the aligned escapement pin **16***a*. However, the "9" amount key is effective only to set the aligned pin **16***a*. Accordingly, as the leftmost escapment pin **16***a* is set, a tension spring **30** extending between the pin carriage and a machine frame side plate **81** advances the pin carriage leftward one increment to align the leftmost row of stop pins with a righthand printing sector **31**. As other keys are depressed, the pin carriage is further advanced incrementally to the left to align additional rows of set stop pins with the sectors **31**.

Each of the printing sectors **31** has a shoulder **32** adapted to limit against a set one of the pins **16** during rocking of the sector. The sector also carries type characters **33** which coact with printing hammers **34** to record amounts on a paper strip **35** which is fed between the sectors and the hammers. Gear teeth **36** on the sectors are arranged to mesh with a suitable accumulator, not shown.

The machine is motor driven through a cyclic clutch **37**, FIG. 3, which is effective to rotate a drive shaft **38** one complete revolution during each cycle. For this purpose, the clutch is controlled by a clutch dog, partly shown at **40**, which is actuated by depression of either of the control keys **12** and **13**. Upon actuation of the clutch dog, a clutch member **41** on the driven side of clutch **37** is released to couple to a motor driven ratchet wheel **42**. Accordingly, a cam **43**, FIG. 2, carried by shaft **38** cooperates with a combined cam follower and sector **44** fulcrumed at **45** to oscillate a gear sector **46** carrying a bail rod **47**. The latter extends through openings **48** in the printing sectors **33** and is yieldably connected to spring tails **50** formed integral with the sectors. Thus, during each cycle the sectors are yieldably advanced clockwise until their shoulders **32** limit against set ones of the stop pins **16** during item entry operations, thus presenting appropriate type characters **33** to be imprinted against the paper strip **35** by the hammers **34**. After printing, the cam **43** is effective to return the sectors to their illustrated home positions.

Means are provided for normally returning the pin carriage to its righthand home position during the latter stages of a machine cycle and for this purpose a cam **52**, FIG. 3, on the shaft **38** coacts with a cam follower **53** fulcrumed at **54** to reciprocate a pin carriage return link **55** (see also FIGS. 4 and 5). The latter has a depending ear **56** engageable with a bellcrank **57** fulcrumed at **58** and connected through a pin and slot coupling **60** to the frame for the pin carriage **15**. The

link **55** is actually effective to overdrive the pin carriage a short distance until it reaches a dotted line position **15***a*, after which it is returned by spring **30** to its full line position. Suitable stationary camming means (not shown) is effective during the return of the pin carriage to return the various stop pins **16** to their illustrated unset positions.

The forward end of the link **55** is slideably connected to the lower end of the repeat key **14** which is guided for vertical movement by slots **62** and **63** formed in the frame side plate **81** and in a key stop frame **64**, respectively. The slots permit a slight rocking movement of the repeat key also about guide edges **73**.

A spring wire **65** is attached at **66** to a forward frame plate **67** and extends through a hole **68** in repeat key stem to urge the latter to its upper position shown in FIG. 4, thereby holding the ear **56** of link **55** in alignment with the bellcrank **57**. Spring **65** also urges the upper end of the repeat key to the left in FIG. 4 and when the key is depressed until a latching shoulder **70** thereon is positioned below the keytop plate **64** the key is moved slightly to the left enabling the shoulder **70** to latch under the plate **64**, thus holding the ear **56** out of cooperative relation with bellcrank **57**. Accordingly, the pin carriage will remain in set condition to enable repeat or multiplying operations.

When it is desired to return the machine to normal condition wherein the pin carriage is automatically returned and cleared during each cycle, the knob **21** is manually moved to its rightmost position, thereby resetting the pin carriage. During this movement of the knob, a part **71** of the frame supporting the pin carriage engages the free end of the wire **65**, causing the same to yield to the right to rock the repeat key slightly clockwise about guide edges **73** and thus release the same from latched condition.

Although the invention has been described in detail and certain specific terms and languages have been used, it is to be understood that the present disclosure is illustrative rather than restrictive and that changes and modifications may be made without departing from the spirit or scope of the invention as set forth in the claims appended hereto.

Having thus described the invention, what is desired to be secured by United States Letters Patent is:

**1.** In a calculating machine having cyclically operable mechanism,

an indexable amount setting means,

restoring means normally operable by said mechanism for restoring said amount setting means to non-indexed condition, and

a report mechanism settable to disabling conditioning to disable said restoring means;



a second restoring means operable independently of said first mentioned restoring means for restoring said amount setting means to non-indexed condition, and

means operable by said second restoring means for releasing said repeat mechanism from disabling condition.

**2.** A calculating machine according to claim **1** wherein said amount setting means comprises a pin carriage and means for indexing said pin carriage.

**3.** A calculating machine according to claim **2** wherein said repeat mechanism comprises a repeat key latchable to disable said first mentioned restoring means, and

means operable by said second restoring means for releasing said repeat key from latched condition.

**4.** A calculating machine according to claim **2** wherein said repeat mechanism comprises a repeat key settable into a disabling condition and wherein said second restoring means comprises a manually operable member.

**5.** In a calculating machine having a cyclically operable mechanism,

a pin carriage,

means for indexing said pin carriage, and

restoring means normally operable by said mechanism for restoring said pin carriage to non-indexed condition,

a repeat mechanism comprising a repeat member latchable in set condition to disable said restoring means;

a second restoring means for restoring said pin carriage to non-indexed condition,

a spring member for maintaining said repeat member in latched condition,

said spring member being effective to maintain said repeat member in unlatched condition, and

said spring member being operable by said second restoring means for releasing said key from latched condition.

**6.** A calculating machine according to claim **5** wherein said second restoring means is effective to restore said pin carriage beyond said non-indexed condition,

said spring means being operable by said second restoring means only during restoration of said pin carriage beyond said non-indexed condition.

**References Cited**

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