May 19, 1964 W. HERGERT 3,133,698

PERFORATOR FOR RECORD CARRIERS

Filed Nov. 27, 1962 2 Sheets-Sheet 1

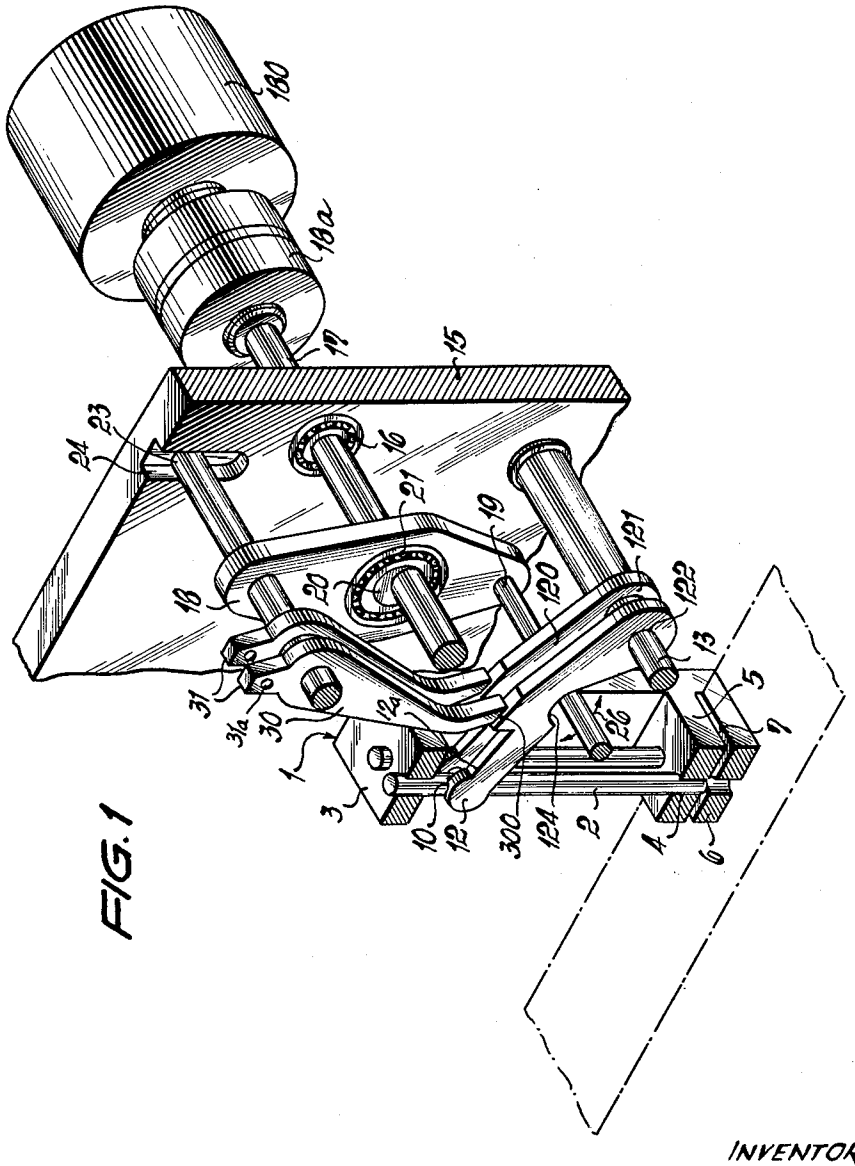

FIG. 1

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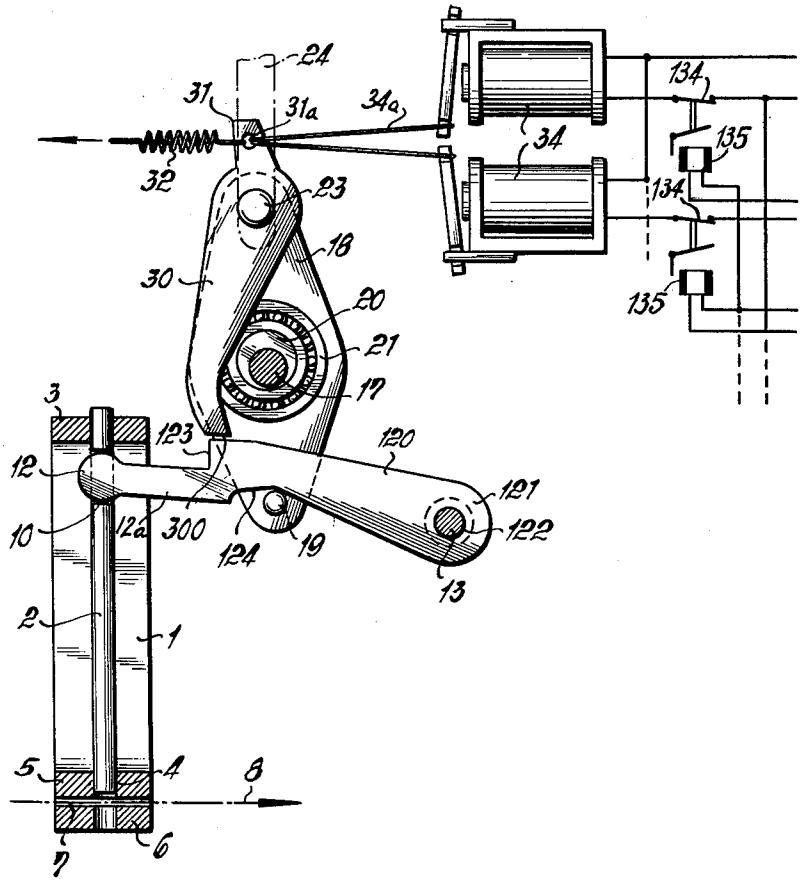
FIG. 2



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PERFORATOR FOR RECORD CARRIERS

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20 Claims. (Cl. 234—115)

The present invention relates to a perforator for record carriers, and more particularly to a perforator for punching rows of coded perforations into record carriers, such as tapes or cards.

It is one object of the present invention to provide a perforator which is capable of working at very high speed.

Another object of the invention is to provide a perforator the movable parts of which have small mass and a minimum of inertia.

Another object of the invention is to provide a perforator controlled by impulses to select punches in accordance with the coded data to be recorded in the form of punched holes on the record carrier.

Another object of the invention is to control the selection of punches by a source of power different from the source which provides the selecting electric control impulses.

Another object of the present invention is to provide a perforator of simple and inexpensive construction which reliably operates without vibrations of the reciprocating parts thereof. With these objects in view, one embodiment of the invention relates to a punching device, such as a coding perforator, and comprises punch means guided on supporting means for movement to and from a punching position, lever means connected to the punch means and being preferably mounted at one for turning movement, and reciprocating drive means for engaging the lever means so that the same are rocked to actuate the punch means to move to and from the punching position.

In the preferred embodiment of the invention, a set of selector levers is provided which are reciprocated in rectilinear direction to engage and turn corresponding actuating levers in such a manner that the actuating levers move corresponding perforator punches to the perforating position. A rod extends across the actuating levers, and is moved in a circular movement to slidably engage the actuating levers to turn the same with the punches to a position in which the punches are inoperative and retracted from the record carrier. While the selector levers move in a rectilinear movement in the same direction as the punches to provide the great force required for the punching operation, the circular movement of the retracting rod eliminates all hammer blows against the actuating levers which would be caused by rectilinear movement of the rod withdrawing the actuating levers and punches.

In the preferred embodiment of the invention, a pair of connecting members connects a shaft carrying the selector levers, and the rod. The shaft is guided for rectilinear movement, and when eccentric members actuate the connecting means, the rod at the other end of the connecting members performs a circular movement to engage the actuating levers of the perforator punches.

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The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view, partially in section, of one embodiment of the perforator according to the invention, one wall being omitted for the sake of clarity; and

FIG. 2 is a cross sectional view of the embodiment of FIG. 1.

Referring now to the drawings, a perforator frame **1** includes an upper part **3**, and a lower part **5** provided with a slot **7** in which a tape **8** is guided. The forward portions of parts **3** and **5** are broken off in FIG. 1 for the sake of clarity. A set of perforating punches **2** is slidably guided in bores **4** of members **3** and **5**, and have cutouts **10** respectively receiving the circular heads **12** of levers **120** having wider end portion **121** provided with bearing bores **122** through which a shaft **13** passes. Shaft **13** is supported in a pair of walls **15** of which only one is shown for the sake of clarity. Each lever **120** can perform an angular reciprocating movement about shaft **13** independently of the other levers **120**, and during such angular reciprocating movement, the corresponding perforator punch **2** will be raised and lowered to pass through slot **7**, and if the tape **8** is located in slot **7**, the tape will be perforated.

Only two punch means including perforator punches **2** and actuating levers **120** are illustrated in FIG. 1, but it will be understood that as many perforator punches **2** and actuating levers **120** are arranged in a row across the tape as the particular code requires.

Each lever **120** has a high abutment portion **123** located opposite a corresponding abutment face **300** of a corresponding selector lever **30** in the illustrated position of selector levers **30**. The selector levers **30** are turnable about a shaft **23**, and when any selector lever **30** is turned in clockwise direction as viewed in FIGS. 1 and 2, its abutment face **300** will be located opposite a narrower end portion of the respective lever **120** which is separated by steep shoulder from the abutment portion **123**.

The underside of each lever **120** has a recess **124**, and a rod **19** extends across recesses **124** of all levers **120**. Rod **19** and shaft **23** are secured to a pair of connecting members **18** of which only one is shown in FIG. 1. The ends of shaft **23** are slidably guided in slots **24** in end walls **15**. A drive motor **180** drives through a coupling **18***a* a drive shaft **17** mounted in ball bearing **16** in walls **15**. Eccentric members **20**, of which only one is shown in FIG. 1, are secured to shaft **17** and located in ball bearings **21** which are mounted in the connecting members **18**. Consequently, rotation of drive shaft **7** by motor **180** will cause an oscillatory movement of connecting members **18**. Since shaft **23** is mounted in a pair of vertical slots **24**, it performs a rectilinear movement, and moves selector levers **30** up and down. The lower ends of connecting members **18** will perform a circular movement as indicated by the arrow **26** in FIG. 1.

During such movement, rod **19** engages the recesses

124 in levers 120, and raises the same together with the perforator punches 2. When the rod 19 moves downward again, selector levers 30 perform a corresponding downward movement, and those selector levers 30 which are in the position shown in FIG. 1, will engage with the respective abutment faces 300 the abutment portions 123 of the corresponding levers 120, and push the same down together with the perforator punches 2 which are thus actuated to move through slot 7 and to perforate a tape located in slot 7.

It will be understood that in accordance with the code, not all perforator punches are to be actuated by levers 120. The selector levers 30 are moved between the operative selecting position shown in the drawing, and an inoperative position in which the abutment faces are located opposite the recessed narrower portion 12*a* of the respective lever 120 by selector means which are shown in FIG. 2. The upper end of each selector lever 30 has an arm 31 provided with a bore 31*a* to which a spring means 32 is connected. A pair of wires 34*a* is also attached to each opening 31*a*, and connected to the armature of electro-magnetic means 34. Each electro-magnetic means 34, when energized, turns the corresponding selector lever 30 in clockwise direction to its inoperative position, and when de-energized, permits the respective spring 32 to turn the selector lever 30 to its operative selecting position shown in FIGS. 1 and 2.

In the normal condition of the apparatus, the electro-magnetic selector means 34 are energized, and consequently all selector levers are in the inoperative position in which the up and down movement of shaft 23 with selector levers 30 will be ineffective to push down levers 120 and perforator punches 2 since selector levers 30 moving downwardly in the inoperative position will not engage the narrow portions 12*a* of levers 120.

Levers 120 will be raised by the vertical component of the circular motion of rod 19, but move down only due to their own weight and the weight of the perforator punches 2 which is not sufficient for perforating the tape 8 so that the end faces of the perforator punches 2 will rest on the tape without perforating the same when the selector levers 30 do not engage the abutment portion 23 of levers 120.

A relay contact 134 is located in the circuit of each electro-magnetic selector means 34, and controlled by a relay 135 which is energized by a control impulse. It will be understood by those skilled in the art that each control impulse associated with one of the electro-magnetic selector means 34 is also associated with a hole position represented by a perforator punch 2. One or several impulses arriving simultaneously at the relays of electro-magnetic selector means 34 will open the corresponding switches and de-energize a corresponding group of electro-magnetic means 34 so that springs 32 will move the respective selector levers 30 to the operative selecting position illustrated in FIG. 2.

Only the thus selected selector levers 30 will be coupled to the corresponding actuating lever 120, while selector levers 30 of electro-magnetic means 34 which remain energized, will remain in the inoperative position in which they are not coupled to the respective corresponding actuating lever 120 during the downward movement of all selector levers 30 under control of eccentric member 20 on drive shaft 17.

The perforator punches 2 whose actuating levers 120 are actuated by selector levers 30 in the coupled selecting position will be forcefully moved downward and perforate tape 8 in slot 7.

Evidently, the arrangement could be reversed, and spring 32 could act in the opposite direction to normally hold selector levers 30 in the inoperative position, while energizing of the electro-magnetic means 34 by signal impulse produces the force for turning selector levers 30 to the selecting position in which they are coupled to the actuating levers 120 during the downward movement of all selector levers 30.

Operation

Drive motor 180 rotates shaft 17 so that the connecting means 18 perform a reciprocating movement together with shaft 23, selector levers 30, and rod 19. However, all relay contacts 134 are closed so that all electro-magnetic means 34 are energized, and turn all selector levers 30 in clockwise direction as viewed in the drawing, to an inoperative position in which the abutment faces 300 are located opposite the recessed portion 12*a* of the actuating levers 120. Consequently, the reciprocating motion of the selector levers 30 will have no effect on the punch means 2, since the end faces 300 of the selector levers 30 cannot engage any part of the corresponding actuating levers 120. Rod 19 performs a circular movement, and while moving along the upper part of the circle, slidingly engages all recesses 124 of the actuating levers 120 so that the same are raised by the force transmitted by rod 19, and move down due to their own weight, and the weight of the perforator punches 2. Since this weight is only small, the perforator punches 2 rest on the tape 8 when engaging the same due to the force of gravity, and are incapable of producing a perforation. If no tape is located in the slot 7, the actuating levers 120 will follow rod 19 to the lowest point, and perforator punches 2 will move accordingly to a lower position passing into corresponding holes in the anvil 6.

Assuming that some of the punches are to be selected for punching a group of holes representing coded information into the tape 8, some of the relays 135 will receive an electric pulse or signal, and will move the corresponding relay contacts 134 to an open position, interrupting the circuit of the thus selected electro-magnetic means 134. When selected electro-magnetic means 34 exert no force on the corresponding selector levers 30, springs 32 are effective to turn the respective selector levers 30 to the illustrated operative position, while electro-magnetic means 34 remaining energized will continue to hold the none-selected selector levers 30 in the inoperative position located opposite the recessed portion 12*a*.

As clearly shown in the drawing, the end faces 300 of selected operative selector levers 30 are located opposite the abutment portion 123 of the corresponding actuating levers 120.

The reciprocation of connecting members 18 with shaft 23 and rod 19 continues as before, but selector levers 30 in operative positions will now engage the corresponding actuating levers 120 and push the same forcefully down together with the associated perforator punches 2 so that holes or perforations are made in the tape 8.

The other selector levers which remain in the inoperative position will again move toward the recessed portion 12*a* without engaging the corresponding actuating levers 120 so that the corresponding punches will again rest on the tape without being actuated to perforate the same.

During the following upward movement of connecting members 18, rod 19 will gradually and slidingly engage the recesses 124 of all actuating levers and raise the same together with the perforator punches 2. Such movement will not be obstructed by the selector levers 30, since the vertical component of the motion of rod 19 covers the same distance as the vertical motion of shaft 23 with selector levers 30.

After a row of perforations has been punched in this manner in tape 8, the tape is transported a step corresponding to the distance between two successive rows of perforations, and after new selector pulses or signals have arrived at the relays 135, and the selector levers have been set in accordance with the different coded information to be punched, connecting means 18 start again the downward movement to effect punching of coded perforations in tape 8.

As best seen in FIG. 2, the selector levers 30 are angular to pass about drive shaft 17. Shaft 23, drive shaft 17 and rod 19 are located in a common plane which

extends substantially in the same direction as the guide means 24 and the movement of perforator punches 2.

Due to the fact that rod 19 performs a circular movement, it gradually engages the curved recess 124 without exerting a blow against the actuating levers 120. While the actuating levers 120 of the selected punches move down all the way with rod 19, the actuating levers 120 of the non-selected punches remain in a higher position with the punches resting on tape 8, as explained above. Consequently, during the return movement of rod 19, rod 19 will first engage and raise the actuating levers 120 which have participated in a perforating operation, and then engage the inoperative actuating levers 120 which are located in a higher position. Due to the circular movement of rod 19, such engagement is gradual and sliding, and does not act as a blow against the inoperative actuating levers 120 which could be caused by a member corresponding to rod 19 but performing a rectilinear return movement.

Due to the fact that levers 120 are one-armed levers, and that selector levers 30 engage an intermediate portion of levers 120, the punches move almost twice the distance than the selector levers 30 so that the reciprocating masses have to be moved only a short distance.

Selector levers 30 are mounted on shaft 23 substantially in the region of the center of gravity, so that very little inertia has to be overcome when selector levers 30 are shifted between operative and inoperative positions.

Furthermore, due to the steep shoulder between abutment portion 123 and recessed portion 12*a* of each actuating lever, the respective selector lever 30 has to perform only very small angular movement between inoperative and operative positions which permits the use of electromagnetic means 34 having very small air gaps.

Since the electro-magnetic means 34 are not directly energized by the signal currents, but are controlled by relay contacts 134 of relays 135 controlled by the signal currents, an independent source of power can be provided for electro-magnetic means 34 which, of course, is capable of providing energizing currents greater than the signal currents.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of punching devices differing from the types described above.

While the invention has been illustrated and described as embodied in a tape perforator having very small reciprocating masses, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A perforator comprising, in combination, supporting means including a supporting shaft; perforator punch means guided on said supporting means for movement to and from a perforating position; lever means having one end mounted on said shaft and another end connected to said perforator punch means; drive shaft means; eccentric means on said drive shaft means; connecting means engaged by said eccentric means intermediate its ends and driven by the same, one end of said connecting means being mounted on said supporting means for rectilinear movement in the direction of movement of said perforator punch means, and the other end of said connecting means performing a circular movement during rotation of said drive shaft means and eccentric means; a first member secured to said one end of said connecting means and performing with the same a rectilinear movement, said first member being located on one side of said lever means; a second member secured to the other end of said connecting means and performing with the same a circular movement, said second member being located on the other side of said lever means so that said first and second members alternately engage said lever means and rock the same to move said perforator punch means to and from said perforating position.

2. A perforator comprising, in combination, supporting means including a supporting shaft; perforator punch means guided on said supporting means for movement to and from a perforating position; lever means having one end mounted on said shaft for turning movement and another end connected to said perforator punch means; and drive shaft means; eccentric means on said drive shaft means; connecting means engaged by said eccentric means intermediate its ends and driven by the same, one end of said connecting means being mounted on said supporting means for rectilinear movement in the direction of movement of said perforator punch means, and the other end of said connecting means performing a circular movement during rotation of said drive shaft means and eccentric means; a shaft member secured to said one end of said connecting means and performing with the same a rectilinear movement; a lever member turnably mounted on said shaft member and located on one side of said lever means; a rod member secured to the other end of said connecting means and performing with the same a circular movement, said rod member being located on the other side of said lever means; selector means for moving said lever member between an operative position for engaging said lever means and an inoperative position so that said lever member in said operative position and said rod member alternately engage said lever means during reciprocation of said connecting means and rock the same in such a manner that said lever member in said operative position effects movement of said perforator punch means to said perforating position and so that said rod member effects movement of said perforator punch means out of said perforating position.

3. A perforator comprising, in combination, supporting means including a supporting shaft; perforator punch means guided on said supporting means for movement to and from a perforating position; lever means having one end mounted on said shaft for turning movement and another end connected to said perforator punch means, said lever means having on one side an abutment portion and a recessed portion adjacent said abutment portion, and being formed on the other side thereof with a recess; and drive shaft means; eccentric means on said drive shaft means; connecting means engaged by said eccentric means intermediate its ends and driven by the same, one end of said connecting means being mounted on said supporting means for rectilinear movement in the direction of movement of said perforator punch means, and the other end of said connecting means performing a circular movement during rotation of said drive shaft means and eccentric means; a shaft member secured to said one end of said connecting means and performing with the same a rectilinear movement; a lever member turnably mounted on said shaft member and located on one side of said lever means, said lever member being turnable between an operative position located opposite said abutment portion and an inoperative position located opposite said recessed portion of said lever means; a rod member secured to the other end of said connecting means and performing with the same a circular movement, said rod member being located on the other side of said lever means in the region of said recess; selector means for moving said lever member between said operative position for engaging said lever means and said inoperative position so that said lever

member in said operative position and said rod member alternately engage said abutment portion and said recess of said lever means during reciprocation of said connecting means and rock the same in such a manner that said lever member in said operative position effects movement of said perforator punch means to said perforating position and so that said rod member effects movement of said perforator punch means out of said perforating position.

4. A perforator comprising, in combination, supporting means including a supporting shaft; drive shaft means mounted on said supporting means and extending parallel to said supporting shaft; eccentric means secured to said drive shaft means; a shaft member mounted on said supporting means guided for rectilinear movement; connecting means having one end turnably mounted on said shaft member and having bearing means engaged by said eccentric means so that said shaft member performs a rectilinear movement during rotation of said drive shaft means while the other end of said connecting means performs a circular movement; a rod mounted on said other end of said connecting means and extending parallel to said shaft member; a set of lever members mounted on said shaft member; a set of perforator punches mounted on said supporting means for movement between an inoperative position, and an operative perforating position; and a set of actuating levers mounted on said supporting shaft for turning movement, each actuating lever being connected to one of said punches, and having a portion located between one of said lever members and said rod so that rotation of said drive shaft means effects rectilinear movement of said lever members and engagement of said lever members with said portions of said actuating levers so that the same move said perforator punches to said perforating position while said rod performs a circular movement with said other end of said connecting means and engages said actuating levers so that the same move said perforator punches to said inoperative position.

5. A perforator comprising, in combination, supporting means including a supporting shaft; drive shaft means mounted on said supporting means and extending parallel to said supporting shaft; eccentric means secured to said drive shaft means; a shaft member mounted on said supporting means guided for rectilinear movement; connecting means having one end turnably mounted on said shaft member and having bearing means engaged by said eccentric means so that said shaft member performs a rectilinear movement during rotation of said drive shaft means while the other end of said connecting means performs a circular movement; a rod mounted on said other end of said connecting means and extending parallel to said shaft member; a set of perforator punches mounted on said supporting means for movement between an inoperative position, and an operative perforating position; a set of actuating levers mounted on said supporting shaft for turning movement, each actuating lever having one end turnably connected to one of said punches and the other end mounted on said supporting shaft for turning movement, each actuating lever having an intermediate portion located between said shaft member and said rod, said intermediate portion having on one side an abutment portion and a recessed portion adjacent said abutment portion, and having on the other side a curved recess located opposite said rod; a set of selector levers mounted on said shaft member opposite said intermediate portions of said actuating levers, respectively, each of said selector levers being turnable on said shaft member between an inoperative position located opposite said recessed portion and an operative position located opposite said abutment portion of the respective actuating lever so that rotation of said drive shaft means effects rectilinear movement of said selector levers, and engagement of selector levers in said operative position with said abutment portions of associated actuating levers so that the same move said perforator punches to said perforating position while selector levers in said inoperative position move toward said recessed portion of the associated actuating levers without engaging the same, said rod performing a circular movement with the other end of said connecting means and sliding on said actuating levers in the region of said recesses so that said actuating levers are turned to move said perforator punches to said inoperative position; and selector means for selectively moving each of said selector levers between said operative and inoperative positions.

6. A perforator comprising, in combination, supporting means including a supporting shaft; drive shaft means mounted on said supporting means and extending parallel to said supporting shaft; eccentric means secured to said drive shaft means; a shaft member mounted on said supporting means guided for rectilinear movement; connecting means having one end turnably mounted on said shaft member and having bearing means engaged by said eccentric means so that said shaft member performs a rectilinear movement during rotation of said drive shaft means while the other end of said connecting means performs a circular movement; a rod mounted on said other end of said connecting means and extending parallel to said shaft member; a set of perforator punches mounted on said supporting means for movement between an inoperative position, and an operative perforating position; a set of actuating levers mounted on said supporting shaft for turning movement, each actuating lever having one end turnably connected to one of said punches and the other end mounted on said supporting shaft for turning movement, each actuating lever having an intermediate portion located between said shaft member and said rod, said intermediate portion having on one side an abutment portion and a recessed portion adjacent said abutment portion, and having on the other side a curved recess located opposite said rod; a set of selector levers mounted on said shaft member opposite said intermediate portions of said actuating levers, respectively, each of said selector levers being turnable on said shaft member between an inoperative position located opposite said recessed portion and an operative position located opposite said abutment portion of the respective actuating lever so that rotation of said drive shaft means effects rectilinear movement of said selector levers, and engagement of selector levers in said operative position with said abutment portions of associated actuating levers so that the same move said perforator punches to said perforating position while selector levers in said inoperative position move toward said recessed portion of the associated actuating levers without engaging the same, said rod performing a circular movement with the other end of said connecting means and sliding on said actuating levers in the region of said recesses so that said actuating levers are turned to move said perforator punches to said inoperative position; and selector means for selectively moving each of said selector levers between said operative and inoperative positions, said selector means including spring means connected to said selector levers and urging the same to one of said positions of the same, and electromagnetic means connected to each of said selector levers for urging selected selector levers to the other position of the same.

7. A perforator as set forth in claim 6 wherein said spring means bias said selector levers to turn to said operative position, and wherein each electromagnetic means turns the respective selector lever to said inoperative position, and holds the same in said inoperative position, when energized.

8. A perforator as set forth in claim 6 and including a relay contact in the circuit of each electromagnetic means, and a relay operating said relay contact and being adapted to be energized by control impulses to open and close said relay contact for de-energizing and energizing said electromagnetic means.

9. A perforator as set forth in claim 6 wherein each of said perforator punches is formed with an elongated open-

ing, and wherein each of said actuating levers has said one end formed as a circular head located in said opening of the associated punch and turnable therein.

10. A perforator as set forth in claim 6 wherein each of said selector levers has on one end thereof a flat end face, and wherein each actuating lever has on said abutment portion a flat abutment face extending parallel to said end face of the associated selector lever in said operative position, each actuating lever having adjacent said abutment face a steep shoulder extending to said recessed portion, each selector lever moving along said shoulder when reciprocating with said shaft member in said inoperative position.

11. A perforator as set forth in claim 6 wherein said supporting means is formed with a straight guide slot, and wherein said shaft member has a portion located on one side of said connecting means and supporting said selector levers, and an end portion projecting from the other side of said connecting means and being slidably guided in said guide slot of said supporting means.

12. A perforator as set forth in claim 6 wherein said selector levers are double-armed levers having an angular main arm extending between said shaft member and said actuating levers, and a second arm extending on the other side of shaft member and being connected to said spring means and to said electromagnetic means.

13. A perforator as set forth in claim 12 wherein said drive shaft means, said shaft member and said rod are located substantially in a plane extending substantially in the direction of movement of said shaft member, said drive shaft means being located on the concave sides of said angular main arms of said selector levers.

14. A punching device comprising, in combination, a set of punch means movable in one direction from retracted positions to punching positions; a set of selector members respectively correlated with said punch means, each selector member being mounted for movement in said one direction, and also for movement between an inoperative position spaced from said punch means, and an operative position coupled for movement only in said one direction with the respective correlated punch means; drive means for moving all said selector members in said one direction; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position.

15. A punching device comprising, in combination, a set of punch means movable in one direction from retracted positions to punching positions; a set of selector members respectively correlated with said punch means, each selector member being mounted for movement in said one direction, and for movement in a direction transverse to said one direction between an inoperative position spaced from said punch means, and an operative position coupled for movement only in said one direction with the respective correlated punch means; drive means for moving all said selector members in said one direction; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position.

16. A punching device comprising, in combination, a set of punch means movable in one direction from retracted positions to punching positions; a shaft member; drive means for reciproacting said shaft member transversely to the axis thereof in said one direction; a set of selector members respectively correlated with said punch means and being mounted on said shaft member for movement with the same in said one direction, and for turning movement on the same between an inoperative position spaced from said punch means, and an operative position coupled for movement in said one direction with the respective correlated punch means; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position.

17. A punching device comprising, in combination, a set of punch means movable in one direction from retracted positions to punching positions; a first shaft member; a second shaft member parallel with said first shaft member and disposed for cooperation with said punch means; drive means for reciprocating said first shaft member transversely to the axis thereof in said one direction and for moving said second shaft member along a circular path transverse to the axis thereof so that said second shaft member slidingly engages said punch means to move the same toward said retracted position; a set of selector members respectively correlated with said punch means and being mounted on said first shaft member for movement with the same in said one direction, and for turning movement on the same between an inoperative position spaced from said punch means, and an operative position coupled for movement only in said one direction with the respective correlated punch means; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position, whereas said second shaft during part of its circular movement permits movement of selected punch means to said punching position and of non-selected punch means to an intermediate position and returns all said punch means to said retracted position during another part of its circular movement.

18. A punching device comprising, in combination, a set of punch means in one direction from retracted positions to punching positions; a first shaft member; means for guiding said first shaft for rectilinear movement in said one direction; a second shaft member parallel with said first shaft member and disposed for cooperation with said punch means; drive means including a drive shaft, eccentric means on said drive shaft, and a connecting member mounted on said eccentric means for turning movement and connected with said first shaft member for reciprocating said first shaft member transversely to the axis thereof in said one direction and connected to said second shaft member for moving said second shaft member along a circular path transverse to the axis thereof so that said second shaft member slidingly engages said punch means to move the same toward said retracted position; a set of selector members respectively correlated with said punch means and being mounted on said first shaft member for movement with the same in said one direction, and for turning movement on the same between an inoperative position spaced from said punch means, and an operative position coupled for movement only in said one direction with the respective correlated punch means; and selector means for movement selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position whereas said second shaft during part of its circular movement permits movement of selected punch means to said punching position and of non-selected punch means to an intermediate position and returns all said punch means to said retracted position during another part of its circular movement.

19. A punching device comprising, in combination, a set of punch means, each punch means including a punch and actuating lever connected to said punch, said punches being movable by said actuating levers in one direction from retracted positions to punching positions and back;

a set of selector members respectively correlated with said punch means, each selector member being mounted for movement in said one direction, and for movement in a direction transverse to said one direction between an inoperative position spaced from said actuating lever, and an operative position coupled for movement only in said one direction with the respective correlated actuating lever; drive means for moving said selector members in said one direction; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position.

20. A punching device comprising, in combination, a set of punch means, each punch means including a punch and actuating lever connected to said punch, said punches being movable by said actuating levers in one direction from retracted positions to punching positions and back; a shaft member; driven means for reciprocating said shaft member transversely to the axis thereof in said

one direction; a set of selector members respectively correlated with said punch means and being mounted on said shaft member for movement with the same in said one direction, and for turning movement on the same between an inoperative position spaced from said actuating lever, and an operative position coupled for movement only in said one direction with the respective correlated actuating lever; means operated by said drive means and connected to said actuating levers for operating the same to return said punches to said retracted positions; and selector means for moving selected selector members from said inoperative position to said operative position so that only punch means coupled to selected selector members in said operative position are driven by the respective selector members to said punching position.

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