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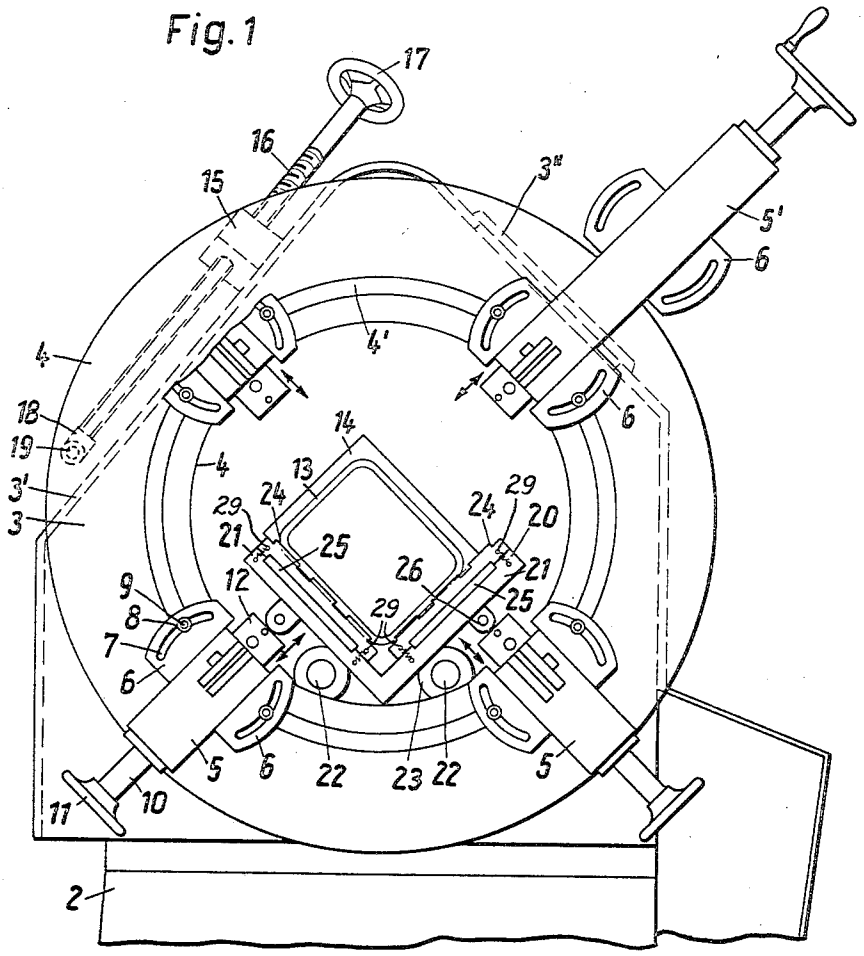
CARD AND ETIQUETTE PUNCHING MACHINE

Filed June 8, 1966

Fig. 1



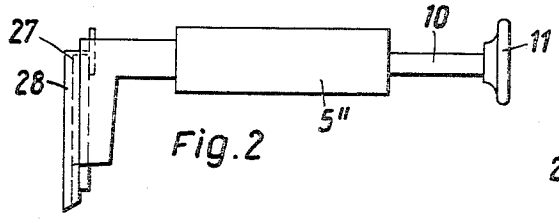
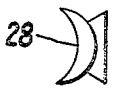


Fig. 2

Fig. 3



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CARD AND ETIQUETTE PUNCHING MACHINE

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ABSTRACT OF THE DISCLOSURE

A card and etiquette punching machine in which at least one punching tool is carried adjustable in substantially radial direction on a ring which in turn is carried turnably about its axis on stationary support means and in which a stack of cards or the like to be punched is carried on a guide channel movable parallel to the ring axis in engagement with the cutting edge of the tool, whereby the angular and lateral position of the tool to the stack of cards may be quickly and easily adjusted.

With the well-known card and etiquette punching machines the punching tool is fixed in a frame of the machine by means of spindle sleeves and opposite to a fixed groove containing the cards and a feeding device for the cards the punching tool is adjusted by regulating the spindle sleeves in such a way that the advance pile of cards or etiquettes will be cut exactly and with as little waste as possible and passing through the punching tool is deposited on a fixed groove. Herewith it is especially difficult and time-wasting to attain a precise adjustment of the punching tool opposite to the pile of cards exactly parallel to the cutting edges or to a centre line of the cards and correctly to height and sides.

In order to attain this three or four spindle sleeves holding the punching tool must be regulated for the precise adjustment, whereby the regulation of one spindle sleeve will influence the adjustment of the punching tool in such a way that also the other spindle sleeves must be adjusted. It is an object of the invention to essentially simplify and accelerate the precise adjustment of the punching tool opposite to the pile of cards or etiquettes.

The invention refers to a card and etiquette punching machine. Its essential factor is that a punching tool corresponding to the form of the cards or etiquettes to be punched can be fixed by spindle sleeves in a large holding ring adjustable and fixable in the machine frame, and that a guide channel receiving the unpunched cards are arranged opposite to the cutting edge of the punching tool, and that the cards can be advanced to the punching tool hydraulically or mechanically. This has the advantage that the punching tool can be easily—roughly at first—adjusted and fixed by the spindle sleeves in the holding ring opposite to the card pile, and that then the punching tool together with the spindle sleeves as a unit can be set into the exact angular degree opposite to the card pile by turning the holding ring.

An advantageous form of execution results when a guide channel having two bearing sides vertically to one another, which bear the pile of cards to be punched, contain separate inserted bearing plates which can be slightly raised or lowered with respect to the bearing sides for the precise adjustment. Hereby the precise adjustment of the card pile opposite to the punching tool as to correct height and side direction is simplified and accelerated.

It is advantageous to fit in between the bearing sides of the guide channel and the inserted bearing plates wedge plates, by longitudinal displacement of which wedge plates the bearing plates can be raised or lowered some millimeters compared to the bearing sides of the guide channel. This enables a very precise adjustment of the bearing plates as to height and likewise to side direction.

With advantage the bearing plates may be pressed down on the wedge plates by springs acting upon pins or hooks of the bearing plates. Hereby tilting of the bearing plates towards the guide channel is prevented.

Another advantageous form of execution results when the guide channel can be displaced in the longitudinal direction and fixed. Hereby the guide channel can be closely advanced to the punching tool, so that the adjusting of the channel with respect to the punching tool is made easier and falling down of the etiquettes or cards from the channel becomes impossible.

With advantage on the spindle sleeves chisel-like punching tools may be fixable which tools cut e.g. from playing cards or the like only the corners quarter circle round or similar and at the same time form grooves for the corners of the cards on which the cards can be advanced from the cutting edges. Thus it is possible to cut the cards by simple rectangular punching tools and later round off the corners in the desired way by single punching tools.

The card pile put in the guide channel may preferably be advanced towards the punching tool by means of a hydraulic piston or a mechanically driven rod.

Preferably a receiving channel for the punched cards or etiquettes is placed behind the turnable holding ring, which channel if necessary can easily be removed and exchanged.

A further advantageous form of execution results when the space lateral of and above the punching tool and the guide channel is provided with a casing having a window which when opened cuts off the drive of the card pile and when shut releases it again. Thus the punching tool is fool-proof.

In FIG. 1 the drawing shows a view of the punching device seen from the ejector front side with a rectangular punching tool with rounded edges, drawn in dot and dash lines, in FIG. 2 a spindle sleeve with a single punching tool for punching one corner of a card, and in FIG. 3 a cross section through the punching tool after FIG. 2.

On a frame **2** is fastened a front plate **3**, upon which a holding ring **4** is mounted so that it may be turned. To this ring can be fastened spindle sleeves **5** provided at their sides with flange **6** with circular slots **7**, in different positions of turning by means of screws **8** and nuts **9** engaging through the slots **7** in an undercut ring groove **4'** of ring **4**.

The spindle sleeves **5** contain screws **10** with hand wheels **11** by means of which the parts **12** can be advanced radially opposite to a punching tool **13**, in order to clamp opposite to a pile of paper or cards **14** the punching tool **13**, e.g. in the form of a rectangular ring with rounded corners for punching playing cards or a punching tool having about the form of a keyhole for punching etiquettes and the like.

Upon the side of front plate **3** there is fastened rotatable a thread piece **15** through which a screw **16** having a hand-wheel **17** can be screwed. The end of this screw engages in a cardan joint **18**, part **19** of which joint is mounted rotating in the holding ring **4**. The holding ring **4** is mounted rotating in the front plate **3** by means of a circular dovetail. Instead of this the front plate **3** may also be provided with circular slots through which screws act in order to mount and fasten the holding ring **4** to the front plate **3** movable by a slight angle. There can also be provided both measures so that the holding ring **3** together with the punching tool **13** fastened to it by the spindle sleeves **5** can be fastened in an adjusted torsional position.

As shown with spindle sleeve **5'** the spindle sleeves **5** can also have more than two flanges in axial distance from one another so that also near the centre of the

holding ring **4** a punching tool can be fastened, or a punching tool placed eccentrically from the middle can be clamped from all sides by the spindle sleeves. When using the second pair of flanges **6** the head **12** of the spindle sleeve can be pushed over the middle of the holding ring **4**.

Behind the holding ring within the range of the inner opening there is mounted movable a guide channel **20** with bearing sides or portions **21** arranged at an angle of 45° on rods **22** of frame **2** by means of ears **23**. On the bearing sides **21** there are bearing plates **24** movable by a few millimeters in relation to the bearing sides **21** as to the height, by means of wedges **25** inserted between parts **21** and **24**. In the longitudinal direction the bearing plates **24** are held unmovable with respect to the bearing sides **21** or the guide channel **20**. On the lower surface of the bearing sides **21** are fastened ears **26** having an innear thread into which are engaging screws turnable by means of a hand wheel. The free ends of these screws are engaging into ears of the wedges **25** passing through slots of the bearing sides of channel **20**. Thus the bearing plates **24**, being unmovable in longitudinal direction can be precisely adjusted as to height in relation to the portions **21** of the guide channel so that the position of a stack of cards **14** resting on the bearing plates **24** may be adjusted relative to the punching tool **13**.

Behind the paper card pile **14** is provided a hydraulic piston—not shown—with a large press-plate by which pile **14** can be pressed against the punching tool, so that the whole pile can be punched in one operation.

In order to adjust the punching tool **13** it is clamped between the heads **12** of the spindle sleeves **5**, and by screwing the spindle sleeves it is set near the pile **13** of cards or the like and roughly adjusted. Then the card pile is advanced to near the cutting edge of the punching tool **13**, and then slight inaccuracies of the angle can be compensated by turning the whole holding ring **4** by means of screw spindles **16**, **17**. This precise adjustment is done very quickly, as all the holding spindle sleeves are fastened to ring **4**. Slight inaccuraries in the height can be compensated by moving the wedges **25** in longitudinal direction.

Tilting of the bearing plates **24** over the front edges of the wedges **25** can be prevented by springs **29** acting on the back or middle parts of the bearing plates **24** by means of screws in order to press down the plates **24** on the wedges **25**.

If rectangular or many-cornered cards or etiquettes are to be provided with round corners or the like then according to FIGS. 2 and 3, instead of the annular punching tools **13** individual narrow punching tools **27** can be fastened to the heads **12** of the spindle sleeves **5''**, which punch only the desired form of the corners of the cards or etiquettes, that is e.g. punching tools with quarter circle formed cutting edges, which continue on the shaft the cutting edge in the form of a hollow or groove **28** so that the punched card pile is held in these hollows and can advance in it.

In continuation of such hollows **28** or an annular punching tool **13** it is expedient to provide upon the frame **2** of the punching machine a receiving channel which, if necessary, can easily be removed and exchanged. The channel **20** and the channel joining the punching tool **13** reach with their ends turned towards the punching tool a little under the punching tool respectively the individual punching tools **27**, **28** held by the spindle sleeves so that when punching the first cards cannot fall down before the punching tool and smoothly slide on the receiving channel behind the punching tool.

On the front plate **3** and a similar back plate of the frame **2** there is arranged a casing **3'** having a window **3''** which window when opened cuts off the drive of the card pile and when shut releases it again. Thus accidents when serving the punching tools **13**, **27**, **28** and the guide channel **20** are prevented. The punching machine can also be used for cardboard foils, asbestos, packing and insulating material or the like.

What I claim is:

1. In a card and etiquette punching machine, in combination, support means; a holding ring mounted on said support means turnably about the axis of said ring; means connected to said support means and said ring for turning said ring about its axis and for holding said ring in any turned position; guide channel means carried by said support means and having a pair of guide faces for supporting and guiding a stack of cards or the like toward the opening defined by said ring with said cards extending substantially normal to said ring axis; at least one punching tool for cutting off peripheral portions of the cards when the latter are advanced in direction of said axis in engagement with said punching tool; and adjusting means carried by said ring movable from retracted to advanced positions engaging said punching tool for adjusting the position of the latter transverse to the ring axis relative to said guide faces of said guide channel means.

2. A machine as defined in claim **1**, wherein said adjusting means comprises a plurality of spindle sleeves carried by said ring extending in substantially radial direction and substantially normal to said ring axis and a screw spindle axially adjustable in each sleeve.

3. A machine as defined in claim **2**, and including means for mounting each spindle sleeve on said ring angularly adjustable about an axis substantially parallel to said ring axis.

4. A machine as defined in claim **1**, wherein said guide channel means comprises a V-shaped base plate having a pair of portions extending substantially normal to each other and each carrying a bearing plate respectively provided with said guide faces, and means cooperating with said bearing plates for adjusting the position thereof relative to said portions of said base plate.

5. A machine as defined in claim **4**, wherein said means for adjusting the position of said bearing plates comprise a wedge plate sandwiched between each bearing plate and respective portion of said base plate.

6. A machine as defined in claim **5** and including spring means cooperating with said plates for maintaining the same in abutment with each other.

7. A machine as defined in claim **1**, wherein said support means includes a pair of rods extending substantially parallel to said ring axis and carrying said guide channel means adjustable in direction of said axis.

8. A machine as defined in claim **2**, and including a plurality of punching tools respectively carried by said screw spindles.

9. A machine as defined in claim **8**, wherein each of said punching tools is substantially moon-shaped and carried by a respective one of said spindles.

10. A machine as defined in claim **2**, wherein said punching tool comprises a member having an endless wall defining an opening and being engageable at the outer surface thereof by said screw spindles to be adjustably carried thereby.

References Cited

UNITED STATES PATENTS

2,288,304	6/1942	Schlattner	83—86
2,483,735	10/1949	Noell	83—123 X

JAMES MEISTER, Primary Examiner

U.S. Cl. X.R.

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