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(71) I, HEIKO IPPEN, of German nationality, trading as KOMMANDITGESELLSCHAFT ARLAC WERK HEIKO IPPEN, of In der Masch 4, 2 Hamburg 61, German Federal Republic, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a card index.

According to the invention there is provided a card index comprising a case having a box-shaped member and a cover plate for said box-shaped member, said cover plate having a recess in its upper surface, a plurality of indicia-bearing sheets or cards stacked one above the other, a cover pivotably mounted on a pivot axis passing through said box-shaped member so that the cover can take up a closed position covering the recess and an open position extending upwardly from said box-shaped member affording visual access to the contents of the recess, means located within said box-shaped member and operatively coupled to said cover for rotating said cover between the closed and opened positions, a plurality of selector keys extending transverse to the pivot axis of said cover and mounted on said cover plate and arranged so that upon the actuation of one of said selector keys a selected card, together with the cards overlying the selected card and said cover can be moved into the opened position in an approximately vertical position, a locking key associated with said means operatively coupled to said cover for returning said cover into its closed position covering the recess, arcuate guides located in the vicinity of said pivot axis for holding the stack of said cards, said cards having longitudinal edges facing said pivot axis and containing selector recesses for the passage of said means operatively coupled to said cover, each said selector key being arranged to move transversely of the pivot axis of said cover, respective double-arm rocking levers for each said selector key, said means operatively coupled to said cover being connected to said rocking levers, and a return spring associated with each said selector key said cover plate having a slot in the portion thereof spaced from the pivot axis of said cover by the recess therein, said slot extending parallel to the horizontal pivot axis of said cover, and having a length substantially equal to the sum of the widths of all of said selector keys and having a width less than the length of said selector keys, each said selector key comprising a wide tongue slidable over the upper surface of said cover plate and bridging said slot, a gripping actuator portion moulded on and extending upwardly from the upper surface of each said tongue, a neck portion secured to the underside of each said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion extending in the width direction of said slot and having a length which is a fraction of the width of said slot, a slide secured to said neck portion and located in the space formed by said box-shaped member and cover plate, a plurality of laterally spaced parallel guide wall portions extending transversely of the pivot axis of said cover and formed integrally with said box-shaped member, each pair of adjacent said guide wall portions forming a guide for one of said slides, a first lug cam located between and extending transversely of each pair of adjacent said guide wall portions, a second lug cam secured to and extending downwardly from each said slide, said second lug cam located intermediate said first lug cam and the pivot axis of said cover plate, each said return spring for said selector keys extending between said first and second lug cams associated with a respective selector key, the end of each said slide closer to the pivot axis of said cover plate having a downwardly extending arm with an opening therethrough, said means operatively coupled to said cover including an actuator rod for each said selector key, each said actuator rod being coupled to the opening in the associated one of said slides and extending therefrom toward the

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pivot axis of said cover plate, each said rocking lever mounted on the pivot axis of said cover plate and having a first arm to which the end of said actuator rod remote from said slide is connected and a second arm which is arranged to engage under a card to lift it and any overlying cards, said second arm having a width related to the width of said tongue-shaped keys, the selector recesses being arranged so that said selector recesses are progressively wider from the second card from the top of the stack to the lowermost card of the stack, and the width of said recesses increasing from card to card by twice the width of a second arm of said rocking levers, and said cover being spaced above the recesses in said cover plate so that a space is formed above the stack of cards which is approximately twice as high as the stack of cards.

Advantageously, said locking key for said cover comprises a wide tongue slidable over the surface of said cover bridging said slot, a gripping actuator portion moulded on and extending upwardly from the upper surface of said tongue, a neck portion secured to the underside of said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion extending in the width direction of said slot and having a length which is a fraction of the width of said slot, a slide secured to said neck portion and located in the space formed by said box-shaped member and cover plate, the end of said slide located closer to the pivot axis of said cover plate having a downwardly extending arm with an opening therethrough, said means operatively coupled to said cover including an actuator rod connected at one end to the opening in said slide, a pivot axis perpendicular to the pivot axes of the cover plate secured to the floor of said bottom member, a two-armed rocking lever mounted on said vertical pivot axis and the end of said actuator rod remote from said slide being connected to one of the arms of said rocking lever, the other said arm of said rocking lever being connected to the pivot axis of said cover plate so that as said locking key is actuated said cover member can be moved from its opened into its closed position.

An embodiment of the present invention will now be described by way of example and with reference to the accompanying drawings, in which:—

Figure 1 is a top view of a card index according to the present invention;

Figure 2 is a top view of the card index of Figure 1 whereby the cover is swung upwardly into an opened position;

Figure 3 is a top view of the card index after removal of the upper case cover plate;

Figure 4 is a lateral cross-sectional view corresponding to the line IV—IV of Figure 3;

Figure 5 is a lateral cross-sectional view corresponding to the line V—V of Figure 4;

Figure 6 is a top view of a stack of cards; and

Figure 7 is a top view showing the index card edges provided with selector recesses in an extended superimposed position.

Referring to Figures 1 and 2, the card index according to the present invention comprises a case 10 with a box-shaped bottom member 11 and an upper case cover plate 12 serving to close the bottom member and provided with a desk-like inclined front portion 12*a*. The upper case cover plate 12 is provided with a tray-shaped recess 13 for receiving a stack of cards 100. This stack of cards 100 may consist of a number of sheets or cards bearing indicia or the like. In the here described and illustrated embodiment there are provided thirteen index cards which are referenced 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112 and 113 respectively, as may be seen in Figures 5, 6 and 7. The individual cards are provided on their front and rear surfaces with line patterns serving to facilitate the entering of names, addresses and phone numbers or the like. The cards are also imprinted with the letters of the alphabet whereby the cord 101 bears on its surface facing the next following card 102 the letter "A" whereas each of the following cards 103—113 is imprinted with two letters, one on each surface, more provided at their longitudinal edges facing the rear of the case 10 with selector recesses 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124 and 125 respectively the purpose of which will be explained further below. The transverse card edges are provided adjacent said longitudinal edges and substantially opposite the selector recesses 114 to 125, with further recesses 126, 127 serving to hold and guide the cards in the card index case 10 (Fig. 6).

The tray-shaped recess 13 may be closed by means of a cover 15 which is preferably of a tray-shaped configuration and includes a peripheral edge of a height corresponding to the height of each card of the stack of cards 100 (Figure 4). The cover 15 is mounted for pivotal movement in the direction of the arrows *x* by means of a pivot axis 16 mounted on the bottom member 11. The cover 15 is provided with arcuate guide rails 17, 18 consisting of angle profiles having flanges which are received in the recesses 126, 127 of the index cards 101 to 113. The index cards 101 to 113 are thereby retained on the cover 15 when the cover is swung upwardly (Fig. 2).

A set of selector keys 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31 and a locking key 32 are provided on the desk-line inclined

front portion 12*a* of the upper case cover plate 12, and forwardly of the tray-shaped recess 13. The selector keys 20 to 31 serve to move any selected card into the viewing position (Figs. 2, 4 and 5) whereas by means of the key 32 the swung up cover 15 will be returned into its closing position. Every selector key 20 to 31 as well as the locking key 32 is provided on its upper surface with a wedge-shaped actuator portion 33 as may be seen best in Fig. 4. The mutual arrangement of these actuator portions 33 is such that the actuator portions 33 on the individual selector keys 20 to 31 and the locking key 32 are mutually staggered so that the ready actuation of the individual selector keys is assured (Fig. 2). The selector keys 20—31 and the locking key 32 are arranged in the form of sliding keys that are slidable transversely of the pivot axis 16. Each selector key consists of a tongue 35 slidable along the upper surface of the upper case cover plate 12, and a neck portion 36 connected to a slide 40 that is movably guided in the interior of the case below the upper cover plate 12. The neck portion 36 of each selector key is disposed within a slot-shaped opening 38 in the upper case cover plate 12. The length of this slot-shaped opening 38 is equal to the sum of the widths of all selector keys 20 to 31 and the locking key 32. The width of the slot-shaped opening 38 is somewhat larger than the length of the neck portion 36 on each selector key so that the neck portion 36 may be shifted within the slot-shaped opening 38 transversely to the longitudinal extension thereof. Since the tongue 35 and the slide of each selector key are longer than the width of the slot-shaped opening 38, each selector key is properly guided on the upper case cover plate 12.

The slides that are associated to the various selector keys 20 to 31 and the locking key 32 and are guided in the interior of the case are referenced 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52 respectively (Fig. 3). Each slide 40 to 52 is guided on a guide plate 53 extending in a parallel direction to the desk-like inclined front portion 12*a* of the upper cover plate 12 between two wall portions 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67 respectively which are integrally molded with the guide plate 53. A lug cam 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81 and 82 respectively is provided at the front end of the guide path of each slide 40 to 52 between the corresponding pair of guide wall portions. Respective springs such as the one indicated by the reference 83 are disposed within the slides 40 to 52 and bear at their one end against an associated one of these abutment cams 70 to 82 and bears with its other free end against another lug cam 84 provided in the interior of the slide having a channel shaped cross-section. The slides 40 to 52 are each provided at their ends facing the pivot axis 16 with a substantially perpendicularly extending arm, the arms being numbered 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141 and 142 respectively. Adjacent its free end, each arm is provided with an opening 143 through which the free offset end of an actuator rod extends. The actuator rods for the various slides are referenced 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161 and 162 respectively (Figs. 3 and 4). The other free end of each actuator rod 150 to 162 is connected to the one arm 170*a*, 171*a*, 172*a*, 173*a*, 174*a*, 175*a*, 176*a*, 177*a*, 178*a*, 179*a*, 180*a*, 181*a* of a two-armed rocking lever 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180 and 181 respectively the number of which corresponds to the number of selector keys 20—31. The other arms of these rocking levers 170 to 181 are referenced 170*b*, 171*b*, 172*b*, 173*b*, 174*b*, 175*b*, 176*b*, 177*b*, 178*b*, 179*b*, 180*b* and 181*b* respectively. The rocking levers 170 to 181 are each of a width corresponding to the width of one of the selector keys 20 to 31 and are rotatably mounted on the pivot axis 16, as may be seen in Figs. 3 and 4. The arms 170*b* to 181*b* of the rocking levers 170 to 180 serve as lifting arms and engage, upon actuation of the associated selector key, the cards in the stack of cards 100 which are associated to the respective arms 170*b* to 181*b*. The overall arrangement is such that for example when the selector key 20 is actuated in the direction of the arrow *y* (Fig. 1) — the selector key 20 thus taking up the position shown in Figs. 2 and 3 — the arm 170*b* of the rocking lever 170 engages the card 101. By actuation of this selector key the arm 170*b* is rotated in the direction of the arrow y_1 (Fig. 4) and moves simultaneously the cover 15 from its closing position into the substantially vertical position shown in Fig. 4 whereby the card 101 will be moved into the same position as the cover 15. When for example the selector key 24 will be actuated, the actuator rod 154 rotates the rocking lever 174 in such a manner that the rocking lever arm 174*b* engages the card 105 and thus moves this card 105 together with the overlying cards 101, 102, 103, 104 and the cover 15 into the opened position of the card index.

The swung up cover 15 may be returned into the closing position by means of the locking key 32. The locking key 32 is arranged similarly to the selector keys 20 to 31 and is likewise connected to the arms 190*a* and 190*b* of a fulcrum rocking lever 190 by means of an actuator rod 162. This actuator rod 162 is connected to the arm 190*a* of the rocking lever 190. The rocking lever 190 is arranged on the floor of the box-shaped bottom member 11 of the case 10 and rotat-

ably mounted about a vertical axis 191. The other arm 190*b* of the rocking lever 190 is connected by means of an actuator rod 192 to the cover pivot axis 16 whereby upon actuation of the locking key 32 in the direction of the arrow y_2 (Fig. 3) the pivot axis 16 will be rotated in a direction in which the cover 15 is moved together with the cards on the cover into the closing position. Simultaneously the actuated selector key is returned into its initial position by means of the return spring 83 (Fig. 3).

The cover 15 may also be returned into the closing position by means of an engagement of the rocking lever 190 with the offset cover portion 15*a* (Fig. 4).

The card index is used as follows: The individual indicia-bearing cards of the stack of cards 100 are associated to the individual selector keys 20 to 31 which are likewise provided with corresponding indicia or corresponding reference or code numbers (Fig. 2). When for example the selector key 20 is moved in the direction of the arrow *y* (Fig. 1) along the upper case cover plate 12 the associated actuator rod 150 will be moved in the same direction and rotates thereby the associated rocking lever, in the present instance the rocking lever 170, in such a manner that the rocking lever arm 170*b* will swing the cord 101 upwardly, together with the cover 15. Thus the card will be moved together with the cover 15 serving as a support into a viewing position in which the selected card is freely visible. When actuating the selector key 20, the spring 83 within the slide 40 will be compressed. When actuating the locking key 32 the cover 15 together with the card or cards lying in the cover will be returned into the closing position whereby simultaneously the key 20 will be returned into its initial position by means of the return spring 83. In order that the lifting arms 170*b* and 181*b* take up a substantially horizontal position when the card index is in its rest position the arms 170*b* to 181*b* rest on vertical cams 200, 201, 203, 204, 205, 206, 207, 208, 209, 210 and 211 respectively that are molded integrally with the floor of the bottom member 11. Due to these cams 200 to 211 a relatively small swivel movement is required for moving the cover 15 into its opened position. On the other hand, the travel of the selector keys 20 to 31 may be kept relatively short.

All parts of the card index, apart from the cover pivot axis 16, the actuator rods 150 to 162 and the return springs 83 are preferably made of plastic materials.

The card index may be made of elements which are readily combined and assembled. This allows for a more economical assembly of the card index. By the fact that the selector keys consist of sliding keys as described reliable operation of the card index is assured. Tilting of the selector keys is avoided and moreover no scratch marks will appear on the case outer surface in the region of the selector keys even after extended periods of usage of the card index.

WHAT I CLAIM IS:—

1. A card index comprising a case having a box-shaped member and cover plate for said box-shaped member, said cover plate having a recess in its upper surface, a plurality of indicia-bearing sheets or cards stacked one above the other, a cover pivotably mounted on a pivot axis passing through said box-shaped member so that the cover can take up a closed position covering the recess and an open position extending upwardly from said box-shaped member affording visual access to the contents of the recess, means located within said box-shaped member and operatively coupled to said cover for rotating said cover between the closed and opened positions, a plurality of selector keys extending transverse to the pivot axis of said cover and mounted on said cover plate and arranged so that upon the actuation of one of said selector keys a selected card, together with the cards overlying the selected card and said cover can be moved into the opened position in an approximately vertical position, a locking key associated with said means operatively coupled to said cover for returning said cover into its closed position covering the recess, arcuate guides located in the vicinity of said pivot axis for holding the stack of said cards, said cards having longitudinal edges facing said pivot axis and containing selector recesses for the passage of said means operatively coupled to said cover, each said selector key being arranged to move transversely of the pivot axis of said cover, respective double-arm rocking levers for each said selector key, said means operatively coupled to said cover being connected to said rocking levers, and a return spring associated with each said selector key said cover plate having a slot in the portion thereof spaced from the pivot axis of said cover by the recess therein, said slot extending parallel to the pivot axis of said cover, and having a length substantially equal to the sum of the widths of all said selector keys and having a width less than the length of said selector keys, each said selector key comprising a wide tongue slidable over the upper surface of said cover plate and bridging said slot, a gripping actuator portion moulded on and extending upwardly from the upper surface of each said tongue, a neck portion secured to the underside of each said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion

* C L M S *

ably mounted about a vertical axis 191. The other arm 190*b* of the rocking lever 190 is connected by means of an actuator rod 192 to the cover pivot axis 16 whereby upon actuation of the locking key 32 in the direction of the arrow y_2 (Fig. 3) the pivot axis 16 will be rotated in a direction in which the cover 15 is moved together with the cards on the cover into the closing position. Simultaneously the actuated selector key is returned into its initial position by means of the return spring 83 (Fig. 3).

The cover 15 may also be returned into the closing position by means of an engagement of the rocking lever 190 with the offset cover portion 15*a* (Fig. 4).

The card index is used as follows: The individual indicia-bearing cards of the stack of cards 100 are associated to the individual selector keys 20 to 31 which are likewise provided with corresponding indicia or corresponding reference or code numbers (Fig. 2). When for example the selector key 20 is moved in the direction of the arrow *y* (Fig. 1) along the upper case cover plate 12 the associated actuator rod 150 will be moved in the same direction and rotates thereby the associated rocking lever, in the present instance the rocking lever 170, in such a manner that the rocking lever arm 170*b* will swing the cord 101 upwardly, together with the cover 15. Thus the card will be moved together with the cover 15 serving as a support into a viewing position in which the selected card is freely visible. When actuating the selector key 20, the spring 83 within the slide 40 will be compressed. When actuating the locking key 32 the cover 15 together with the card or cards lying in the cover will be returned into the closing position whereby simultaneously the key 20 will be returned into its initial position by means of the return spring 83. In order that the lifting arms 170*b* and 181*b* take up a substantially horizontal position when the card index is in its rest position the arms 170*b* to 181*b* rest on vertical cams 200, 201, 203, 204, 205, 206, 207, 208, 209, 210 and 211 respectively that are molded integrally with the floor of the bottom member 11. Due to these cams 200 to 211 a relatively small swivel movement is required for moving the cover 15 into its opened position. On the other hand, the travel of the selector keys 20 to 31 may be kept relatively short.

All parts of the card index, apart from the cover pivot axis 16, the actuator rods 150 to 162 and the return springs 83 are preferably made of plastic materials.

The card index may be made of elements which are readily combined and assembled. This allows for a more economical assembly of the card index. By the fact that the selector keys consist of sliding keys as described reliable operation of the card index is assured. Tilting of the selector keys is avoided and moreover no scratch marks will appear on the case outer surface in the region of the selector keys even after extended periods of usage of the card index.

WHAT I CLAIM IS:—

1. A card index comprising a case having a box-shaped member and cover plate for said box-shaped member, said cover plate having a recess in its upper surface, a plurality of indicia-bearing sheets or cards stacked one above the other, a cover pivotably mounted on a pivot axis passing through said box-shaped member so that the cover can take up a closed position covering the recess and an open position extending upwardly from said box-shaped member affording visual access to the contents of the recess, means located within said box-shaped member and operatively coupled to said cover for rotating said cover between the closed and opened positions, a plurality of selector keys extending transverse to the pivot axis of said cover and mounted on said cover plate and arranged so that upon the actuation of one of said selector keys a selected card, together with the cards overlying the selected card and said cover can be moved into the opened position in an approximately vertical position, a locking key associated with said means operatively coupled to said cover for returning said cover into its closed position covering the recess, arcuate guides located in the vicinity of said pivot axis for holding the stack of said cards, said cards having longitudinal edges facing said pivot axis and containing selector recesses for the passage of said means operatively coupled to said cover, each said selector key being arranged to move transversely of the pivot axis of said cover, respective double-arm rocking levers for each said selector key, said means operatively coupled to said cover being connected to said rocking levers, and a return spring associated with each said selector key said cover plate having a slot in the portion thereof spaced from the pivot axis of said cover by the recess therein, said slot extending parallel to the pivot axis of said cover, and having a length substantially equal to the sum of the widths of all said selector keys and having a width less than the length of said selector keys, each said selector key comprising a wide tongue slidable over the upper surface of said cover plate and bridging said slot, a gripping actuator portion moulded on and extending upwardly from the upper surface of each said tongue, a neck portion secured to the underside of each said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion

extending in the width direction of said slot and having a length which is a fraction of the width of said slot, a slide secured to said neck portion and located in the space formed by said box-shaped member and cover plate, and plurality of laterally spaced parallel guide wall portions extending transversely of the pivot axis of said cover and formed integrally with said box-shaped member, each pair of adjacent said guide wall portions forming a guide for one of said slides, a first lug cam located between and extending transversely of each pair of adjacent said guide wall portions, a second lug cam secured to and extending downwardly from each said slide, said second lug cam located intermediate said first lug cam and the pivot axis of said cover plate, each said return spring for said selector keys extending between said first and second lug cams associated with a respective selector key, the end of each said slide closer to the pivot axis of said cover plate having a downwardly extending arm with an opening therethrough, said means operatively coupled to said cover including an actuator rod for each said selector key, each said actuator rod being coupled to the opening in the associated one of said slides and extending therefrom toward the pivot axis of said cover plate, each said rocking lever mounted on the pivot axis of said cover plate and having a first arm to which the end of said actuator rod remote from said slide is connected and a second arm which is arranged to engage under a card to lift it and any overlying cards, said second arm having a width related to the width of said tongue-shaped keys, the selector recesses being arranged so that said selector recesses are progressively wider from the second card from the top of the stack to the lowermost card of the stack, and the width of said recesses increasing from card to card by twice the width of a second arm of said rocking levers, and said cover being spaced above the recesses in said cover plate so that a space is formed above the stack of cards which is approximately twice as high as the stack of cards.

2. A card index according to claim 1, wherein said locking key for said cover comprises a wide tongue slidable over the surface of said cover bridging said slot, a gripping actuator portion moulded on and extending upwardly from the upper surface of said tongue, a neck portion secured to the underside of said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion extending in the width direction of said slot and having a length which is a fraction of the width of said slot, a slide secured to said neck portion and located in the space formed by said box-shaped member and cover plate, the end of said slide located closer to the pivot axis of said cover plate having a downwardly extending arm with an opening therethrough, said means operatively coupled to said cover including an actuator rod connected at one end to the opening in said slide, a pivot axis perpendicular to the pivot axes of the cover plate secured to the floor of said bottom member, a two-armed rocking lever mounted on said vertical pivot axis and the end of said actuator rod remote from said slide being connected to one of the arms of said rocking lever, the other said arm of said rocking lever being connected to the pivot axis of said cover so that as said locking key is actuated said cover member can be moved from its opened into its closed position.

3. A card index according to claim 1, wherein said locking key for said cover comprises a wide tongue slidable over the surface of said cover, a gripping actuator portion moulded on and extending upwardly from the upper surface of said tongue, a neck portion secured to the underside of said tongue and extending downwardly therefrom through said slot into the space formed by said box-shaped member and cover plate, said neck portion extending in the width direction of said slot and having a length which is a fraction of the width of said slot, a slide secured to said neck portion and located in the space formed by said box-shaped member and cover plate, the end of said slide located closer to the pivot axis of said cover plate having a downwardly extending arm with an opening therethrough, said means operatively coupled to said cover including an actuator rod connected at one end to the opening in said slide, a two-armed rocking lever pivotable about an axis perpendicular to the axis of the cover plate and the end of said actutor rod remote from said slide being connected to one of the arms of said rocking lever, said cover having an offset cover portion, the other said arm of said rocking lever being arranged to engage said offset cover portion of said cover for returning said cover from its open to its closed position.

4. A card index substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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