Credit card holder having adjustable bias friction element.

The invention relates to a card holder provided with an internal friction element to keep the cards inside the holder while allowing the user to move the cards with his fingers, such that gravity force alone is too weak to move the cards. Preferably the holder is also provided with a device (further also called “ejector”) to eject or dispense the cards, e.g. credit cards or bank cards, or different flat or plate like objects, from the holder. The card or cards preferably tightly fit within the holder, for which the holder has a cavity similar to the shape and slightly bigger than the card or cards stack. The ejected cards are preferably presented as a staggered stack, preferably wherein each card is shifted at least 0.5 or 1 or 2 millimetre and/or less than 10 or 15 millimetre relative to the next adjacent card, partly projecting from the holder and/or stored as a neat stack, preferably wherein all cards are mutually registered and thus the stack has a completely rectangular or cuboidal shape, e.g. like a rectangular or cuboidal pad.

Preferably, for the so called credit card format the main dimensions suffice ISO 7810 and/or the thickness and corner roundings suffice ISO 7813. This format is applied for many cards with a diversity of applications: bank cards, driving licenses, membership cards, entry tickets, reduction cards, savings cards, ID-cards, etc. Typically the width is 53 - 54 and/or the length is 85 - 86 millimetre and/or a stack of 6 cards is between 5.5 and 6 millimetre thick. Preferably, the space (also called “housing”) of the holder to contain the stack of cards has one or more of the following dimensions (in millimetre): width at least 50 or 52 and/or not more than 55 or 60; length at least 80 or 83 or 84 and/or not more than 86 or 87 or 90; height at least 3 or 4.5 and/or not more than 8 or 10; height such that a maximum of 6 or 7 bank cards without embossing fits within the space without causing damage to the bank cards and/or holder while repeatedly sliding the stack in and out the holder. The cards preferably have a solid, not foldable shape and/or a smooth, slippery, low friction surface. The holder and/or housing preferably has a rigid flat box or

sleeve or cuboidal shape.

A card has a top face and opposite to it a back face of equal dimension and has four sides having the same thickness as the card thickness. The top face is provided by the length and width of the card and is preferably elongated. A card stack has a top face and opposite to it a back face of equal dimension, equal to the dimension of the top face of a card. The card stack has four sides having the same thickness as the stack thickness. The stack thickness is provided by the summed thickness of all cards of the stack.

It will be appreciated that, with the invention, the friction element directly engages the minor side, preferably the long minor side, of all cards of the stack simultaneously. Thus the friction element engages the narrow side of each card of which the dimension is provided by the card thickness. The friction element provides a pressing force to the minor side of each card. This pressing force acts in the direction parallel to the top face of each card and perpendicular to the direction of ejecting the cards, e.g. in widthwise direction, of each card. Also, the surface of the friction element that engages the cards is facing in widthwise direction of the holder and the cards. The result is that the cards are squeezed in the widthwise direction of the holder and the cards. In the present document, the friction element is of the type “widthwise acting friction element” and this type is applied to the holder of the invention. This type is clearly different from another type of friction element (refer to, e.g., US2185624-A) that engages the top face of the upper most card of the stack and is pressed onto the cards stack and is facing in thickness direction of the cards stack, thus the cards below the upper most card have no direct engagement with the friction element and due to the friction element the cards stack is squeezed in thickness direction of the holder and the cards such that the cards of the stack are pressed onto each other.

The friction element generates a friction force in the direction parallel to the top face of each card and parallel to the direction of ejecting the cards.

The thickness direction of the friction element is perpendicular to the friction surface of the friction element facing the cards stack stored within the holder, in different words parallel to the widthwise direction of the holder or the direction from the one long minor side straight to the opposite long minor side of the holder.

Advantageously, such one or more friction elements may provide that the one or more cards are gripped and/or engaged so that they are held within the housing during movement of the ejector mechanism relative to the housing. In particular, such one or more friction elements may provide that the one or more cards are more stable and safe during movement of the ejector mechanism relative to the housing. This is advantageous because the one or more cards may then be stable and safe within the housing when they are fully or partially stored within the housing.

In here, without to be exhaustive or complete, the following expressions can indicate identical or functional equivalent features, possibly as genus or species, dependent from the context: card opening or card entrance or mouth; mechanical projection or stack arresting element or arresting element or card lock or lock or locking end or locking element or distal longitudinal end; sensor or detector or probe; groove or enlargement or widening or expansion or channel or chamber; friction arm or leg shaped element or elongated support or card engaging device or leg or strip or sheet or transmission means or transmission arm or transmission element or transfer element or transfer arm or resilient flexural elongate element or elongate element or pressing means or urging means or elongate part; ejector mechanism or card ejector or eject arm or ejector arm or arm or feature or ejector feature or ejector device or eject device or ejector or eject means; inward or outward or sideways or widthwise; hump or bulge or protuberance or boss; movement or displacement or move or displace; friction element or friction means or friction pad; face or side or wall.

Card holders are disclosed in, e.g., US2002/074246, US4887739, US5718329 and JP S60-179484 U.

EP-A 0 287 532, CH702919 B1, WO2010137975 and WO2014098580 disclose a pivoting ejector arm provided with a stepped profile along its length such that each card engages with a different edge at the ejector arm, the cards are simultaneously dispensed to present a staggered stack of cards, partly projecting out the card holder. These four documents also disclose a widthwise acting friction element.

The above documents provide background knowledge for the present invention and their disclosure is enclosed herein by reference.

WO2010137975 addresses a problem that arises with a widhtwise acting friction element. It discloses the teaching that cards of credit card format indeed have a standardised dimension, but this has always some dispersion due to unavoidable fabrication tolerances. An against the side (the side which extends in thickness direction of the cards) of a stack of not equally wide cards pushing rigid surface, such as a blade spring type friction element, only bears against the edges of the widest cards, so not against the edges of all cards. The preferred friction element is for that reason designed such that it not only engages oversized cards in the stack, but also undersized cards, even if a card of oversized width is stacked between two cards of undersized width. With a stack of three or more cards in the holder with all a slightly different width the friction element is nevertheless sufficiently engaged with all cards individually to avoid that a card can spontaneously move from the holder. This is provided by a sufficient deformable surface, in stead of a rigid surface, of the friction element pushing against the edges of the cards.

US2014014676A1 applies a widthwise acting friction element and discloses in fig. 7 a card holder of which the external wall of one of its long minor sides is provided by a parallel to the long minor sides extending rigid pivoting arm carrying two friction pads of rubber between which the pivot point is present. Depending on the pivoted state of the pivoting arm, the one or the other friction pad engages the cards. Pivoting of the pivoting arm causes rotation of the eject arm

to eject the cards and also causes that the rubber pads are displaced to and from the cards in such manner that the one rubber pad becomes disengaged and the other rubber pad becomes engaged with the cards stack within the holder. In this manner the one rubber pad frictionally engages the cards while they are completely stored within the holder and the other rubber pad frictionally engages the cards while they are ejected by the eject arm to partly project from the holder. This design however has drawbacks and also is silent about durability of the rubber pads.

DE202008003127U1 discloses a snapping card lock separate from a manually against the cards urged friction element. US2022/079316A1 discloses a separate, hingedly mounted card lock provided with an axis of rotation and located at the minor side opposite the minor side having a friction element.

The object of the invention is versatile. In one aspect the object is a more secure storing of the cards within the holder, in particular heavy cards, e.g. made of metal. In one aspect the object is a further improvement of the prior art in avoiding unwanted movements or jamming of the cards within the holder, e.g. at the time of ejecting the stack of cards. Additional possible aspects are a comfortable, simple and accurate operation of the holder with long life or providing the holder with a slim profile to carry within a pants pocket. In yet another aspect the object is error free handling or low production costs. In another aspect the object is improved durability, e.g. less wear of the friction elements engaging the cards and retaining them in position within the holder. Other aspects can be learned from the specification, drawings or claims. Two or more aspects can be combined.

A special aspect is based on the formerly unknown phenomenon, discovered by the inventor, that with the prior art friction element sometimes a card spontaneously drops from the holder in case the same holder is used with a stack of a varying number of cards, e.g. first three cards for e.g. a month and subsequently five cards. Trying to solve this problem the inventor started experiments and to his surprise the present

invention provided a convenient solution. Besides, the inventor also discovered that the present invention provides a more constant friction force during the lifetime of the holder.

The invention is preferably directed to

- the subject matter of the claims and/or
- the subject matter of the clauses and/or
- at least one of below inventions 1-6 and/or
- the subject matter obtained by combining two or more of a claim, a clause and an invention 1-6:

1. a holder for cards provided with a mechanical projection located, in the locking position, in the track of the cards inside the card receiving space, provided at the distal longitudinal end of the leg, the leg preferably carrying the friction pad, to lock or arrest the completely inserted cards in place. The mechanical projection preferably has resilient bias, provided by biasing means of the holder, such that it can be urged out of the way to a release position by passing cards during operation of the ejector mechanism to positively eject the cards; the sideways movement of the mechanical projection from the locking to the release position is preferably over a distance of at least 1 or 2 millimetre.

2. a holder for cards provided with a mechanical sensor located in the track of the cards inside the card receiving space, which sensor is drivingly connected to the distal longitudinal end of the leg to cause a bias and/or displacement of the locking end towards the cards, and which sensor is designed to be directly engaged and displaced by passing cards inside the card receiving space, which displacement of the sensor provides the driving force to bias and/or displace or deflect the locking end; the sideways movement of the locking end from the locking to the release position is preferably over a distance of at least 1 or 2 millimetre.

3. a holder for cards provided with a, preferably extruded, longitudinally extending internal channel, e.g. provided by a groove, containing the leg, the distal longitudinal end, i.e. the end near or at the card opening, of the leg preferably being narrowed, preferably at least 0.5 or 1 millimetre, to inward

leave the internal channel; and/or the distal longitudinal end, i.e. the end near or at the card opening, of the internal channel being widened inwardly, such that the distal longitudinal end of the leg is allowed, without leaving the internal channel, to move inward beyond the boundary of the non-widened part of the internal channel; and/or the internal channel has a sideways dimension along its complete length equal to the sideways dimension of the distal longitudinal end of the internal channel in case only the distal longitudinal end of the internal channel would have been widened sideways, such that the distal longitudinal end of the leg is allowed, without leaving the internal channel, to sufficiently move inward. The inward movement allowed preferably at least 1 or 2 millimetre. The distal longitudinal end of the leg could be the locking end. The internal channel is part of the card receiving space. During said movement, the distal longitudinal end of the leg remains inside the card receiving space.

4. a holder for cards provided with a mechanical probe located in the track of the cards, which probe is drivingly connected to the friction pad to cause a bias and/or displacement of the friction pad towards the cards, and which probe is designed to be directly engaged and displaced by passing cards inside the card receiving space, which displacement of the probe provides the driving force to bias and/or displace the friction pad; the inward movement of the probe and/or friction pad is preferably at least 1 or 2 millimetre.

5. a holder for cards provided with a leg having locally a mechanical boss (i.e. boss) projecting from the leg at least 0.1 or 0.2 millimetre at its face facing the associated minor side and the boss preferably having one or more of: supported and/or contacted by a minor side; located at a distance of at least 3 or 5 or 7 millimetre and/or less than 40 or 35 or 30 or 15 or 10 millimetre from the distal longitudinal end (adjacent the card opening) of the leg, which distal longitudinal end preferably carries a mechanical probe or projection or sensor; located at the side of a tilting area

opposite the side facing the mechanical probe or projection or sensor; provided by an impression or embossing or indentation of the leg; covering at least 50% and/or less than 95% the width of the leg; ends remote from the longitudinal edges of the leg; the dimension in leg longitudinal direction is at least 0.5 and/or less than 5 or 3 or 2 millimetre; covered by the friction pad, preferably completely, more preferably the friction pad extends at least 3 or 5 millimetre beyond the boss in one or both longitudinal leg directions; elongated shape; long dimension perpendicular to the length direction of the leg; two are present, mutually spaced in leg longitudinal direction at least 5 or 10 millimetre and/or less than 30 or 40 millimetre. Experiments showed: such improves the functioning and service life of the leg.

6. a holder for cards provided with a leg having a thinned or recessed area or length part, commonly named zone, preferably thinned or recessed at least 0.5 or 1 and/or less than 2, 3, 4 or 5 millimetre and preferably one or more applies to the zone: extending from the leg outer surface preferably over the complete zone length; located at a distance of less than 40 or 35 or 30 millimetre from the distal longitudinal end of the leg, which distal longitudinal end preferably carries a mechanical probe or projection or sensor; provided at the leg side facing the associated holder minor side, or the opposite side, or both said sides; covering at least 50% or 100% the width of the leg; its dimension (i.e. length) in leg longitudinal direction is at least 1 or 3 or 5 or 10 or 15 and/or less than 50 or 60 millimetre; located at the side of a tilting area opposite the side facing the mechanical probe or projection or sensor; covered by the friction pad, preferably the friction pad is only present at the zone and/or absent outside the zone. Such zone allows deflection of the leg, particularly of the zone.

Preferably, at least the inventions 2 and 3, more preferably the inventions 1, 2, 3 and 4 are all combined simultaneously in the card holder. One of the inventions 1-6 can be combined with at least one of the other inventions 1-6

and/or with any of the claims.

The probe and the projection can be the same element. In the following they are commonly referred to as “locking end” unless explicitly mentioned differently. The sensor and the friction pad can be the same element. In the following they are commonly referred to as “friction pad” unless explicitly mentioned differently.

A direct mechanical coupling between the actuation of the displacement of the friction pad and the actuation of the eject arm is superfluous and preferably such is absent.

Preferably, according to the invention, the cards directly actuate the locking end as soon as the cards are ejected from the holder and this causes actuation or generates driving action or displacement of the friction pad. In this manner the pressure of the friction pad against the completely inserted cards can at least be diminished or even be cancelled, increasing the life of the friction pad. If the cards partly project from the holder, the friction pad can provide the desired friction due to increased force provided by deflection of the locking end caused by the partly projecting cards.

Preferably one or more of the following applies: between the locking end and the friction pad a transmission means is active; there is a direct mechanical coupling and thus a direct drive between the locking element, the transmission means and the friction pad; the locking end and the transmission means and the friction pad are carried by the leg.

Preferably the leg comprises a tilting area loosely resting and/or pushing against the proximal minor side of the holder, preferably if the cards are inserted, preferably such that they are engaged by the friction pad, and preferably one or more of the following applies to the tilting area: longitudinally of the leg located between the locking end and the friction pad; and/or at least 2 millimetre and/or less than 10 or 15 millimetre from the locking end; longitudinally of the leg a dimension less than 2 or 4 millimetre; faces the associated minor side of the holder; part of the transmission means; configured such that it maintains resting and/or pushing

against the minor side of the holder while the, preferably directly adjacent, leg part at the one longitudinal side of the tilting area moves outward and simultaneously the, preferably directly adjacent, leg part at the opposite longitudinal side moves correspondingly inward, or vice versa; the, preferably directly adjacent, leg part at the one longitudinal side of the tilting area and/or the, preferably immediately adjacent, leg part at the opposite longitudinal side of the tilting area, has a gap of at least 0.1 or 0.5 millimetre with the minor side, preferably for a length of at least 2 or 4 millimetre.

To obtain a preferred integrated design, one or more of the following preferably applies for the mechanical relation and/or coupling of one or more of the following features, or a length part, e.g. as part of the leg, carrying such feature: mechanical projection, mechanical sensor, mechanical probe, locking end, locking element, mechanical boss, zone, transmission means, seat of the friction pad, friction pad, tilting area; with the leg and/or mutually: is integral part of and/or embedded with and/or merges continuously or uninterrupted with the leg; is united with the leg by a rigid coupling or material hinge and/or seamlessly and/or without a pivot axis or mechanical, e.g. pin, hinge; forms (or functions or behaves as) a whole and/or a one-piece element and/or a single piece element with the leg; the desired movement of the feature, e.g. switching between the locking and release position, e.g. the inward and outward displacement of the locking end and the friction pad, is merely or exclusively caused by elastic deformation due to deflection and/or flexing and/or bending of the material of e.g. the leg and/or the transmission means. Such integrated design is e.g. obtained by injection moulding of e.g. a polymer or deforming, e.g. bending or pressing or deep drawing of forging a metal strip or plate or sheet, e.g. of spring steel. Typically, a mechanical hinge allows mutual rotation of the parts coupled by the hinge and is provided by at least two or three separate parts, two of which parts are mutually coupled to allow hinging (synonyms are pivoting or

swivelling) of the one part relative to the other, e.g. by tight fit (e.g. as with a ball joint) between the two parts, or by a third separate part, e.g. a pivot pin, coupling said two parts to allow them mutual hinging.

The invention is, according to one aspect, based on the teaching to detect the position of the cards (completely inserted or partly projecting from the holder) and to apply this information to displace or bias the friction element, preferably in the direction from the first to the second minor wall, e.g. to change its pressure and/or friction force onto the stack.

The Prior Art teaches an internal extruded continuous longitudinal groove in the main walls at each minor wall, thus at the widthwise ends of the card receiving space, providing a continuous enlargement or channel of the card receiving space in the direction from the first to the second main wall, the card engaging device is located in the channel and has a width, measured from the first to the second main wall, such as to only fit inside the channel (such is illustrated in, e.g., fig. 12, 14 and 15). The dimensions of the Prior Art groove are constant over its entire length (i.e. the dimension in the direction of arrow L in fig. 1) and the dimension of this known groove in the direction from the first to the second minor wall, thus the width of the groove, in other words the distance between minor wall 32 and the inward boundary 36 as illustrated by fig. 15, is 2 millimetre or 3.5% of the width of the card receiving space. The known card receiving space has a width equal to the distance between the first and second minor walls, as being 57 millimetre and the distance between the inward boundary of both grooves is 53.3 millimetre, thus a 54 millimetre wide card centred in the card receiving space projects at both its widthwise edges, e.g. illustrated in fig. 15, 0.35 millimetre or 0.65% of the card width into the channel, which means, in different words, that both the widthwise edge parts of the centred card, that are the exclusive or only parts of the card that are present inside the channel, have a width, as measured

in the direction from the first to the second minor wall, of 0.35 millimetre or 0.65% of the card width.

The friction pad (and also the leg) is retained in sideways direction by the internal channel. Such retainment could alternatively be provided by e.g. fixing the friction pad to the minor wall by e.g. glue or screws. Other alternatives are feasible.

One or more of the following preferably applies: the locking end is located at the card opening or within a distance of 5 or 10 millimetre; the locking end engages the rounding at the corner near the card opening of the completely inserted card; the locking end is provided at a minor side, preferably within a distance of 2 or 4 millimetre; two locking ends are provided, each at an opposite side to hold the cards between them and each associated with an individual transmission means; the friction pad is located within a distance of 30 millimetre from the card opening for a proper operation of the transmission means; hinges, e.g. pin hinges, between locking end and transmission means and friction element are absent; the transmission means operates by way of flexure and/or leverage; the transmission means and/or leg comprise an S-like shaped length part; the locking end, the transmission means and the friction pad are located in only the area of the holder extending for half the holder length from the card opening; shaped such that the locking end and the friction pad move in mutual opposite directions, preferably by sharing a tilting or swivel area mutually and with the associated minor side; the leg extend lengthwise of the holder and/or cover at least 90% or 95% of the holder length.

To avoid that the cards can spontaneously leave the card holder, e.g. while the urging force of the friction pads is lowered, e.g. since the friction pads are retracted by the locking end, the device is preferably provided with card retaining means, preferably of mechanical type. Such retaining means could be embodied by a lid, e.g. as disclosed in EP-A 0 287 532. However, preferably, the sensor or locking end provides this feature, e.g. embodied as mechanical probe or

cam.

Preferably the friction pads are one or more of: separate from the walls of the housing; spaced from the walls of the housing; not of solid metal at least for the surface facing the cards stack or the layer providing said surface and/or the opposite surface (e.g. facing the spring means or pressing means) or the layer providing said surface; fibre like or provided by fibres, at least for the surface facing the cards stack.

Preferably, according to the invention the internal friction means, e.g. friction pad, has a friction surface, facing the cards stack, preferably non-rigid, e.g. non-metal. Public prior use teaches a fibre like surface, facing the cards stack, provided by a friction pad of fibres, e.g. a felt, which friction pad is backed by a metal blade spring and between the friction pad and the metal blade spring a layer of adhesive agent having a thickness typical for glue (i.e. less than 0.2 millimetre).

The friction surface is preferably wear resistant and/or offers a high level of friction with a view to the intensive sliding contact with the cards. Wear resistant also means resistance against cutting by the engaging thin and rather sharp sides of the cards. This is preferably provided by fibres.

The friction surface can be of fibrous or fibrous like or non-fibrous nature. Fibrous or fibrous like e.g. could be a fabric or mat or web or nonwoven or woven or braided or knitted work or equivalent. Non-fibrous e.g. could be a sheet or foil or film or slab, e.g. obtained by casting or injection moulding or rolling or pressing. It also could be foam or foam like or sponge or sponge like. If fibrous or fibrous like, the fibres are preferably held together by mutual engagement or interlocking or mutual hooking or entanglement, such that a separate means, e.g. adhesive agent or matrix, is not necessary. Preferably such means, e.g. adhesive agent or matrix, is absent. The fibrous or fibrous like layer can be fabricated by one or more of pressing, air laying, needling, needle punching and equivalent.

The friction surface providing the face of the friction

pad facing the cards stack stored within the holder, is preferably provided by a yarn or fibre or fibre like material, preferably of coherent nature, e.g. felt or felt like or fabric or fabric like, woven or non-woven, preferably comprising wool of e.g. sheep or hair, wool or bristles (e.g. pig) from a different mammal. However yarns or fibres from another origin, e.g. natural (e.g. cellulose or protein or mineral based) or synthetic (e.g. PA or PU or PVC or PP based) polymers or vegetal, e.g. cotton, are also feasible. However, it could be of non-fibrous nature, e.g. provided by a solid pad of rubber or silicone or elastomer.

The thickness of the friction pad is preferably at least 20 or 30 or 60 denier or at least 50 or 100 dtex or at least 5 Ne or at least 0.25 or 0.5 millimetre and/or not more than 3 or 5 or 7 or 10 millimetre.

Preferably the friction means comprises, viewed in thickness direction, one or more of: a surface layer, e.g. felt, providing the face for engagement with the cards within the housing; a backing layer, e.g. latex; a fastening layer, e.g. glue; a supporting layer (i.e. the leg), e.g. blade spring, e.g. of metal or polymer.

The friction means can comprise a friction pad which provides the face engaging the cards within the holder to retain them against spontaneous movement and the opposite face of the pad is e.g. facing or mounted to spring means, e.g. a blade spring, to bias the friction means towards the cards within the holder.

Preferably the friction pad has one or more of the following features: pad like; a surface of sufficient width/dimension to simultaneously engage all cards in the stack, thus e.g. extending substantially the complete height of the space of the card holder in which the card stack is received; a surface which is not rigid, and/or is indeed locally, preferably elastically, compressible, and/or in which preferably elastically a relief or surface profile or irregular surface can be made, and/or in which easily, preferably elastically, one or more grooves or pits can be made, and/or

which can be deformed like the surface of a wadded pillow or felt layer, and/or which easily yields locally, and/or is easily, preferably elastically, deformable, and/or easily adapts in shape to the shape, such as the relief or profile or irregularity, of the surface of the side of a card stack, which side is pressed against the surface of the friction element. Preferably with these features it is provided that the friction pad and the individual edges of all cards in the stack properly connect such that the friction pad engages properly each individual edge of all cards in the stack to exert sufficient friction force to hold each card of the stack without the ability to slide such that more force is required then only gravity to slide a card from the holder.

Preferably, the invention distinguishes the following 15 situations:

1. in which the cards are completely in the housing and the friction pad is released or at least partly released from the task to prevent that cards drop from the housing e.g. at moments that the card holder is stored, e.g. in a trousers pocket;

2. as soon as the cards partly project from the holder to select a card and remove it individually and the friction pad given the task to prevent that cards drop from the housing.

Preferably, only if the cards partly project from the housing, the cards are in engagement or are in sufficient engagement with the friction pads and the friction pad is thus effective to prevent that cards drop spontaneously from the holder.

Preferably, the invention offers the possibility for the user to, after the card stack is partly slid from the housing, select an individual card, mutually shift cards in the stack, wherein only the card against which the user pushes with the finger tips, will move, while the other cards at that time keep their position relative to the housing.

Preferably, the friction pad in the housing of the card holder according to the invention, comprises a substrate with a rough fibre like surface structure, providing the friction

surface which engages the cards. If fibres with a large density project from the surface, a good and intensive contact will arise between the friction pad and each individual card in the supported card stack. Even if a fibre of a smooth material, like polyamide is used, the friction between cards and friction pad is sufficiently large to facilitate the above mentioned user operations.

Preferably, the level of the friction which the cards sense during sliding, is directly proportional to the normal force with which the cards push against the friction pad. This normal force is during the complete service life, frequently many years, frequently required. If, for metal cards, the normal force at the friction pad is increased, also the risk increases that the fibres wear or permanent deform, thus the friction force could decrease after some time. To optimise the life it is desirable to limit the pressure of the cards at the friction pad. This is obtained by the invention. It is preferred to design the friction pad from a material type which does not relax or shows little relax at permanent load, like e.g. a fabric or felt of fibres, e.g. of metal or polymer or wool.

Preferably, a holder according to the invention comprises at the inner side of the housing straight opposite the friction pad a resilient element, e.g. a blade spring (i.e. the leg), with the effect that the above mentioned normal force at the friction pad will stay within determined limits, despite the tolerances of the dimensions of the housing and cards. Alternatively, the holder according to the invention has the friction pad and the resilient element assembled, e.g. into a single resilient friction element (i.e. the leg supporting the friction pad). Preferably, the holder comprises at the inner side of the housing two opposite friction pads, preferably one or both assembled with a leg.

Preferably the holder is provided with a card remove feature, e.g. an eject arm or even a recess dimensioned such that, via the recess, the user can engage the cards with a finger and push them partly outward. The card remove feature offers the user the opportunity to partly slide the card stack from

the housing. This is a preferred operation before the user can select a card and remove it from the housing.

Preferably one or more of the following applies to the holder: a rectangular shape, preferably elongated; fixed and/or rigid shape, robust, of light weight material, e.g. metal or polymer material, polyester, PP; box or sleeve shaped; the card storage space receives a cards stack with tight fit; fixed length, width and depth; an ejector mechanism of the cards, preferably at the longitudinal end of the card holder opposite the card access opening to the housing space in which the cards are stored; extruded; made from aluminium.

Preferably the invention is directed to a card holder provided, as card remove feature, with an ejector mechanism, also called ejector device, dispensing the complete stack of cards, thus all cards of the stack are dispensed simultaneously, e.g. since the ejector mechanism simultaneously engages the complete cards stack at the time of ejecting the cards. Preferably the cards are urged from the housing in such a manner that a staggered stack of cards, partly projecting out the card holder, is presented. This is preferably provided by the design of the ejector device. More preferably the design of the card holder or the ejector device is such that when the cards stack is completely contained within the card holder, the cards are mutually in register (in other words the cards are not staggered or the stack is neat), and preferably is partly projected from the card holder, wherein the cards are presented in a staggered fashion. By presenting the cards in staggered fashion, they can be easily individually identified and individually taken from the stack by two fingers of the hand of the user. The card holder is preferably rigid in relation to the typical loads to which the card holder is exposed during normal daily use.

In particular the holder is designed to receive and dispense credit cards (and different items with dimensions comparable to credit cards, further mentioned as “cards”), preferably wherein a stack of, e.g. at least three, four or five, cards can be housed in the holder, more preferably wherein the cards in the stack are immediately mutually superposed or

adjacent, in other words no further object, e.g. spacer, is or needs be present between adjacent cards. The holder preferably has two pairs of substantially or completely closed and fixed opposite sides, one pair with length and width almost equal to the same card dimensions (also called by any of the synonyms “main sides” or “main faces” or “main walls”) and this pair spaced by the other (also called by any of the synonyms “minor sides” or “minor faces” or “minor walls”) pair (delimiting the stack thickness) such that the card stack tightly fits between these four sides or at least between the main walls. Preferably these sides are thin walled and/or provide a rigid, sleeve like casing. Of the remaining pair of two opposite sides (typically located at the longitudinal ends of the sleeve) preferably one (also called the “bottom”) is permanently substantially or completely closed and the other (also called the “top” or “card opening”) is open but could be temporary closed, e.g. by a lid, such that the holder preferably has merely a single open side through which the cards can enter and exit the holder. Thus the holder provides a rigid sleeve with closed bottom. Typically the cards enter and exit the holder by moving parallel to their main sides. The temporary closure could comprise a pivoting lid or a flexible part, e.g. a rubber cap.

Preferably, the card ejector feature of the invention comprises a step like element, which by the user relative to the housing, e.g. by means of rotation or translation, can be moved against the cards stack, wherein the individual steps of the step like element exert at the individual cards in the stack in the direction of the card opening a force, resulting that the card stack slides outward in stepped shape. The steps have a thickness which is measured parallel to the card thickness and a spacing which is measured perpendicular to the thickness and which determines the degree wherein the cards slide mutually if they slide in stepped shape from the housing. Above cited WO2010137975 and WO2014098580, the contents of which is inserted in here by reference, provide further preferred details of the step like element.

The step like element of the card ejector is one example of an ejector element, also called “ejector arm” or simply “arm” or “ejector lever” or simply “lever”, moving between a first and second (preferably a retracted and an extended, respectively) position inside the holder and engaging the cards stack, preferably engaging an edge of the cards, to push the cards stack out of the holder while the cards move in a plane parallel to their main faces, preferably such that the cards (with the ejector element in its extended position) partly project from the holder in a stepped or staggered manner. For the purpose of presenting or dispensing the cards in a stepped manner, the ejector arm is preferably provided with a relief, also called “stepped”, profile, preferably having some relation with the thickness of the cards, such that the element has a plurality of spaced features, preferably located along a straight line, e.g. lengthwise of the arm, a such feature designed to engage a single card from the stack, preferably such that by movement of the element within the holder, the one card is moving with the element for a further distance outward compared to another card from the same stack within the holder. Preferably, such features are projections at the arm each providing an engagement edge (also called “face” or “contact face”), wherein preferably the projections project a different distance from the element such that each engagement face is present at a different level. Preferably the arm is designed such that, in its retracted position, the cards fit within the holder such that the cards are mutually in register, in other words, present a neat stack. The spacing of the features is preferably at least 0.5 or 1 millimetre and/or less than 10 or 15 millimetre.

The features, e.g. steps, preferably each comprise a straight portion and a curved portion and/or at least partly extend across the width of the arm. Optionally, the straight portion of each of the one or more steps is arranged perpendicular to the longitudinal direction of the arm and extends in the direction of the width of the arm. Optionally, the curved portion of each of the one or more steps extends

from the straight portion at one end thereof and curves towards the longitudinal direction of the lever. When the ejector mechanism is moved, a card in the housing may move by initially following the curved portion. Advantageously, such an arm may provide that the ejector mechanism may be configured to translate and/or push each of the one or more cards at least partially out of the opening of the housing. Optionally, the curved portion of each of the one or more steps is configured to engage and/or contact one of the one or more cards when the arm is pivoted relative to the opening of the housing.

Preferably the height (meaning the dimension normal to the housing main sides and parallel to the thickness direction of the cards or cards stack loaded into the housing) of the ejector arm stepwise increases longitudinally from the free end (in other words the distal end or the end remote from the pivot point or the end opposite the end to which the drive means engage or are mounted). This stepwise increase of height (also named: thickness) provides step shaped features or contact faces for ejecting the cards stack in a staggered fashion.

The number of steps preferably at least equals the number of cards within the stack and/or is at least 4 or 5 or 6 or 7. The steps preferably have approximately equal longitudinal spacing and/or height.

In its extended position, the ejector arm preferably extends, preferably for at least 80% or 90% of its length, diagonally within the holder or makes an angle between 20 and 90 degrees (90 degrees equals a right angle), preferably at least 45 or 55 or 60 degrees and/or less than 85 degrees, compared to its retracted position. In its retracted position, the ejector arm preferably extends, preferably for at least 80% or 90% of its length, parallel to an external side (also called “bottom”) or edge of the holder, preferably opposite the side from which the cards are dispensed from within the holder. Preferably the ejector arm rotates or swivels or turns or hinges or pivots between its first and second position, for which it is preferably provided with a hinge or pivot feature, such as a pin or hole, with which it is mounted to the holder.

In the alternative a translating movement is feasible.

Preferably the ejector arm has one or more of: non articulated; fixed shape; its length part that is provided with the complete stepped profile has a fixed shape.

To provide the movement of the eject means, e.g. ejector arm, the ejector comprises a drive means, e.g. associated with the ejector arm. This could be a motoric means however a manually operated drive means, e.g. a finger operated button, is preferred, preferably projecting or located outside the housing. Preferably the ejector arm and the drive means are connected in a rigid manner such that the movement of the drive means is directly transferred to the ejector arm and both these members move as one, e.g. since both these members, or at least part of the ejector arm, are integrated in a single, preferably rigid piece. The ejector arm and/or drive means could be injection moulded parts, e.g. of polymeric or plastic or equivalent material. The finger operated button preferably projects from a minor side of the holder, e.g. a minor side extending in lengthwise (e.g. long minor side) or transverse (e.g. short minor side) direction of the holder.

Preferably the ejector arm provides or is part of, a base or bottom of the holder, or part of it, preventing exit of the cards from the associated side of the holder.

The card ejector feature gives the user the opportunity to partly slide the card stack from the housing. This is a preferred operation before the user can select a card and remove it from the housing.

By the time the eject arm is in its extended position, the cards are partly slid from the housing as a staggered or stepped stack such that each card presents an outside the housing projecting, exposed narrow strip of its upper main side and by viewing these strips the user can see at a blink which cards are present in the holder. Also the user can easily and quickly select within the cards stack the desired card and remove it by manually sliding the cards mutually in a direction equal to or opposite the direction in which the cards are slid from the housing from their entirely inserted, i.e. stored,

position.

Preferably, the ejector, or part of it, e.g. the arm, as card remove feature of the card holder of the invention, is provided with or associated, e.g. coupled, with a reset means, e.g. a spring, with the effect that the ejector or the relevant part after operation will always immediately and automatically return to the initial position, e.g. move from the extended to the retracted position. Such by the reset means provided return offers the advantage such that without obstruction the user can slide cards back into the housing during making a selection from the partly exposed cards.

Preferably, the card holder of the invention has a housing made of a galvanic material, e.g. metal. The geometry of the housing of this invention lends itself for fabrication by means of metal extrusion, with which a proper Faraday cage is made.

The invention also relates to each and any combination and permutation of the above individual features.

The invention will now be further explained by way of the drawing, showing presently preferred embodiments. The drawing shows in:

Fig. 1 - 2 a card holder, in perspective view;

Fig. 3 a cross section of the fig. 1 card holder;

Fig. 4 a cross section of an alternative card holder;

Fig. 5 a back view of the fig. 1 card holder;

Fig. 6 a pivoted ejector arm engaging and ejecting a staggered cards stack;

Fig. 7 the fig. 6 ejector arm from the opposite side;

Fig. 8 the distal part of the fig. 6 ejector arm;

Fig. 9 – 10 a cross section of the fig. 1 card holder;

Fig. 11 an exploded view of a stack of cards and part of the fig. 1 card holder;

Fig. 12 an exploded view of the parts of the fig. 1 card holder;

Fig. 13 an exploded view of internal parts of the fig. 1 card holder;

Fig. 14 a detail of fig. 12;

Fig. 15 a detail of a stack of cards in the holder;

Fig. 16 a detail of the fig. 1 card holder;

Fig. 17-18 the fig. 16 detail provided with a first and second embodiment of the invention;

Fig. 19 a first embodiment of an inventive part of the card holder;

Fig. 20 a side view of the fig. 19 embodiment;

Fig. 21 a top view of the fig. 16 embodiment;

Fig. 22 a first alternative of the fig. 19 embodiment;

Fig. 23 a second alternative of the fig. 19 embodiment;

Fig. 24 a front view of the fig. 19 embodiment;

Fig. 25 a sectional view of a card holder provided with the fig. 21 embodiment;

Fig. 26 an alternative to the fig. 25 embodiment;

Fig. 27 a detail of the fig. 17 embodiment;

Fig. 28 a detail of the fig. 26 embodiment;

Fig. 29A-B an alternative, based on invention nr. 6, of the fig. 19 embodiment in a locked or arrested position;

Fig. 30A-B the fig. 29 embodiment in an ejected or released position;

Fig. 31 a side view of the fig. 22 embodiment;

Fig. 32A-C a side view of the fig. 27 embodiment and of a Prior Art embodiment;

Figs. 33A-B alternative embodiments of invention nr. 6; and

Figa. 34A-D views of an embodiment of invention nr. 5.

Fig. 1 – 2 show a perspective view of the housing 1 of the card holder which tightly fits around the shown stack 2 of at least three cards (four are shown), wherein one of the two longitudinal ends of the housing is referred to as a card opening 3 because it is opened to receive and remove cards. The tightly fit around the card stack implicates a main shape based on a right angled brick, but it can of course, for reasons of design or ergonomics, differ, e.g. by providing chamfers, roundings, ribs, etc.

Arrow L is the long or longitudinal, arrow W the short or widthwise and arrow T the thickness direction. Arrows L, W and T are mutually perpendicular.

Fig. 1 shows the holder 1 and a neat stack 2 of four cards in register, ready to be loaded into the holder through the cards opening 3. If completely located in the holder, the lower side of each card is in register with a relevant engagement face 19 of the ejector arm 16 in its first (retracted) position. Starting from this position of the ejector arm 16 and moving (pivoting) it to its second position, the cards will be forced by the associated engagement face 19 such that the cards stack is partly ejected. Since each engagement face 19 has a different distance to the pivot point 17 of the ejector arm 16, each card will travel a different distance such that a staggered ejected stack 2 is obtained (shown in fig. 2 in which the ejector arm (not shown) is in its second position), each card presenting an exposed narrow strip of a main side as shown.

Fig. 3 shows in sectional view a holder (without cards) with a card eject feature (in the first (retracted) position) provided by the stepped element 16 which can pivot around an axis 17 if the user exerts in the pivot direction (according to the arrow B) a force through the actuator 18 outside the housing 1. The stepped element 16 is made from steps providing card contact faces 19 designed to exert force against the minor side (i.e. the thin side) of the cards to be ejected. The card contact faces 19 can be regarded as the thickness of the steps in the stepped shape and the height of these faces is equal to or smaller then the nominal card thickness (approx. 0.8 millimetre), whereby each step contacts a different card. A reset spring 20 ensures that the stepped element 16 after releasing the button 18 returns immediately and automatically to the initial (first) position shown. Friction elements 6, i.e. pads having a to the cards facing surface 12 of rough fibre like material, e.g. felt, are located mutually opposite within the housing at the housing minor sides 32 to engage each individual minor card side to retain the cards against gravity force.

Fig. 4 shows a possible variant of fig. 3, the stepped element 16 can translate in the direction in which the cards are slid through the card opening 3 and out the housing and

which by means of a reset spring 20 after releasing the operation part 18 returns immediately and automatically to the initial position.

Fig. 3 shows the connection between the button 18 and the ejector arm 16 extending through a passage in the bottom edge, meaning the edge opposite the opening 3. Alternatively such passage could be present in a side edge (long minor side 32) or even in a main side 31. The button 18 is shown adjacent the bottom edge, however could be located adjacent a side edge or even a main side 31. The bottom edge or side edge is a short minor side 32, bridging the main sides 31. These locations of the passage and button 18 are known from the prior art.

Fig. 5 shows the view from the bottom side (i.e. according to arrow A in fig. 1).

In fig. 6-7 the housing is removed such that the elements within the housing are visible. The eject arm 16 is pivoted to its second (extended) position, engaging the staggered cards stack 2 (only partly shown). Arm 16 is, by pivot 17, pivotably mounted to a fixture 10 which is fixedly located in the housing opening opposite the card opening 3, thus providing a closure at the bottom side of the housing.

As is clear from fig. 3, 4, 6 and 7, the thickness of the ejector arm 16 stepwise decreases from the proximal (i.e. close to the pivot point 17) to the distal (synonym: free or remote) end 5. The maximum ejector arm 16 thickness equals the height of the housing determined by the clearance between the two main sides 31 of the housing which equals the maximum thickness of a cards stack tightly fitting in the housing 1. The maximum ejector arm 16 thickness could be slightly thinner to allow movement of the arm 16 within the housing without undue friction with the inner faces of the opposite housing main sides 31 along which the top and bottom side, respectively, of the arm 16 slide.

The opposite main side walls 31 have smooth, level and flat inner faces, extending mutually parallel.

Fig. 7 shows the illustration of fig. 6 from the opposite side, cards 2 removed. Fig. 8 shows at a larger scale the free (synonym: remote or distal) end part of the ejector arm 16 shown

in fig. 7, to show the steps 19 more in detail to emphasize that each step 19 has an edge partly curved and partly straight, each such edge designed for engagement with the side edge of a single card 2 of the stack for pushing and staggering the stack outward.

Fig. 9 shows a section of a possible embodiment of the housing 1 without details of the card remove feature 16, wherein one can see how at at least one side near card opening 3 a friction pad 6 is located, which pushes against a long side of the card stack in the housing. The opposite side in the housing 1 has a resilient flexural elongate element (i.e. leg) 7, e.g. blade spring, providing that both the completely inward slid cards 2 and the partly outward slid cards 2 push against the friction pad 6 with substantially constant force. Fig. 10 shows a comparable embodiment according to the view of fig. 9, and the friction pad 6 and the leg 7 at one side combined such that friction pad 6 has improved resilience relative to the cards. At the opposite side within the housing a separate friction pad 6 can be present or alternatively leg 7 covered by friction pad 6. Arrow T (not shown) is perpendicular to the plane of the drawing.

The location of the friction pad 6 can vary and also its length. Fig. 9-10 only show non-limiting examples.

Fig. 11 shows the friction pad 6 providing the friction surface 12 facing the cards stack 2 and designed to engage the thin sides of each individual card. The surface 12 provides a surface of fibres for the engaged cards 2. Part of the housing 1 is also shown.

Fig. 12-15 show the possible mounting of the legs 7, to the housing of the card holder, and also the spatial relation of housing parts and a stored stack of cards 2. Appreciate the housing internal chambers or channels 11, mutually opposite, into which an individual leg 7, carrying an associated friction pad 6, is longitudinally inserted to be retained in place within the internal chamber 11 by friction and clamping. These internal chambers 11 boarder longitudinally the internal space of the housing 1, capturing the cards 2. Legs 7 extend in direction

L and cover the complete distance between fixture 10 and card opening 3. Fig. 15 shows that longitudinal edges of cards 2 project into internal chambers 11 to engage friction pad 6 covering leg 7.

A functional equivalent name for the internal chambers 11 is “confinement channel” or “channel”. An alternative definition is that the internal chambers 11 are provided by a dilation or dilatation or spatial expansion, preferably at least 0.2 or 0.5 millimetre, in thickness direction T of the one or both widthwise edge areas of the spacing B2 (viz. fig. 21) of the opposite main faces 31, to obtain the spacing B1 (viz. fig. 21). Appreciate that the internal chambers 11 merge with the spacing B2.

Fig. 16 shows the prior art embodiment of the internal chamber 11 and fig. 17-18 show a first and second embodiment of the design of the internal chamber 11 according to the invention. In fig. 17 and 18, at the longitudinal end at the card opening 3, the internal chamber 11 expands, preferably at least 0.5 or 1 millimetre, towards the opposite, i.e. distal, minor face 32, preferably for a distance from the card opening 3 of at least 2 or 5 and/or less than 10 or 20 millimetre. In fig. 17 the expansion 35, and thus the increase in distance between inward boundary 36 and proximal minor face 32, is smooth, in fig. 18 the expansion 35, and thus the increase in distance between inward boundary 36 and proximal minor face 32, is stepwise.

Fig. 19-20 show a first embodiment of the design of the leg 7 according to the invention, provided with a member 21 that could function as a locking end and/or mechanical probe. Tilting area 34 of leg 7 slides across and is supported by minor side 32. The member 21 has width B2 (viz. fig. 24) or less and thus can exit internal chamber 11 by passing the inward boundary 36 (viz. fig. 21). The leg 7 has a width more than B2, e.g. B1, and thus is unable to sideways exit internal chamber 11.

In case the member 21 is a mechanical probe 21, it is biased, by the material elasticity of leg 7, inward towards the opposite, i.e. distal, minor face 32 and is moved outward by the cards

as soon as the cards are inserted into the holder. Outward movement of the probe 21 is transmitted, due to the flexural rigidity of leg 7, in particular length part 33, to the length part of leg 7 covered by friction pad 6 such that, due to elastic flexing or bending of said length part, the friction pad 6 is urged and/or moved inward towards the opposite minor face 32 and thus towards the cards inside the holder, increasing the force with which the friction pad 6 engages the cards. This leverage effect is improved if in tilting area 34 leg 7 is supported by the proximal minor face 32.

In case the member 21 is a locking end 21, it engages and confines the widthwise extending card edges that face in the direction of ejection from the card holder. Preferably, the locking end 21 is moved by an actuator between a releasing position and a locking position. Preferably, the actuator and the leg 7 together provide a single piece.

Fig. 22-23 show alternative designs of the member 21. In all cases shown member 21 and leg element 7 together provide a single piece and member 21 is obtained by plastic deformation of metal. However alternatives, e.g. moulded, e.g. injection moulded, are feasible.

Fig. 25 illustrates the synchronous, oppositely directed movement in widthwise direction W of the friction pad 6, e.g. functioning as mechanical card sensor and/or actuator, and the member 21 due to tilting area 34 urged against minor side 32. During card insertion, the cards load the friction pad 6 in outward direction (arrow P) causing simultaneous, synchronous inward (arrow R) loading of member 21, however corresponding inward movement of member 21 is limited by the cards 2 as long as they are not completely inserted. As soon as the cards 2 are completely inserted, member 21 is allowed (viz. also fig. 27) to take the maximum inward moved position (shown in dotted lines), being the locking position, causing simultaneous and synchronous lowering of the bias of the friction pad 6 against the cards, avoiding wear of the friction pad due to e.g. creep.

Fig. 26 shows the synchronous, oppositely directed movement in longitudinal direction L of the member 21 and a

mechanical card sensor and/or actuator 22, part of leg 7 and designed to be engaged by the widthwise extending card edge facing in the direction of inserting the card into the card holder. By way of sensor 22 and associated pivot 23, the member 21 is allowed to move (viz. also fig. 28) from the releasing position to the locking position (shown in dotted lines).

In fig. 29-30 the transmission means, part of leg 7 as a single piece, operates by way of flexure and/or leverage; the transmission means provides two arm like elements (the one associated with the probe 21 and the other with the friction pad 6) in mutual elongation, possibly staggered, sharing a tilting means 34 between them such that the distal end of the one arm displaces opposite to the distal end of the other arm; the probe 21, the transmission means and the friction pad 6 are located in only the area of the holder extending for half the holder length from the card opening 3. Outside this area the leg 7 is substantially less flexible due to its substantially increased thickness.

Fig. 31 shows a preferred design of leg 7 provided with locking end 21 near card opening 3. Tilting area 34 contacts and pushes minor side 32, from there leg 7 and extension 33 diverge away from side 32. Leg 7, locking end 21, tilting area 34 and extension 33 are part of a single piece (i.e. a one-piece design).

Fig. 32A illustrates the Prior Art leg 7, ending at the tilting area 34. Fig. 32B illustrates the inventive leg 7, extended beyond tilting area 34 by arm 33 and probe 21. Fig. 32C illustrates exaggerated the flexural behaviour of leg 7. If the locking end 21 moves in inward direction (arrow R), the part of leg 7 that carries friction pad 6 moves outward (arrow P) since tilting area 34 is supported by minor side 32.

Figs. 33A-B show two examples of the invention embodied by injection moulded leg 7, provided with a thinned or recessed area or length part, commonly named zone, thus having at least 10% improved flexibility. The distal extension 33 of leg 7 carries a mechanical probe 21 and provides leverage since inflexible. The zone is substantially covered by friction pad

6 and extends the complete width (i.e. perpendicular to the surface of the image) of leg 7. The zone is located at the side of the tilting area 34 opposite the side facing the mechanical probe 21. In fig. 33A the zone is provided at a single side (facing friction pad 6 or, by way of alternative, the opposite side), in fig. 33B at both sides. Thus, the friction pad 6, supported by the flexible zone of elongate element 7, is forced inward (arrow P) if probe 21 is forced outward (arrow R) as the cards 2 engage probe 21 while they are inserted through opening 3.

Figs. 34A-D show a holder for cards provided with a leg 7 having two bosses 37, 38 projecting from the leg 7 at its face facing the associated (i.e. proximal) minor side 32. These bosses are located at the side of the tilting area 34 opposite the side facing the mechanical probe 21. The boss 37 is covered by the friction pad 6 (viz. fig. 34C). The bosses 37, 38 are mutually identical, extend substantially the complete width of leg 7, project at least 0.2 millimetre from the surface of leg 7 and provided by indentations, e.g. obtained by deep drawing the sheet material of leg 7.

Also, non-disclosed embodiments belong to the invention. Features of different disclosed embodiments can in different manners be combined and different aspects of some features are regarded mutually exchangeable. All described or in the drawing disclosed features provide as such or in arbitrary combination the subject matter of the invention, also independent from their arrangement in the claims or their referral.

CLAUSES

1. A holder for a stack of cards comprising preferably at least one of:

I- a, preferably extruded, housing (1), having a, preferably flat and/or oblong, card receiving space, of preferably rectangular box or cuboid or sleeve shape, provided between opposite, mutually spaced first and second main walls (31), which determine a maximum thickness of the stack (2) between

them and opposite, mutually spaced first and second minor walls (32), perpendicular to the main walls and fixed or integrated with the main walls, the main walls configured for a tight fit of the height of a stack of at least three cards between them, the minor walls configured to accommodate the width (W) of the stack between them, the main and minor walls preferably rectangular shaped, the housing having at least one card opening (3) for inserting and ejecting the stack into and from the card receiving space, preferably such that the stack is slid in and out the holder parallel to the main and minor walls, the main and minor walls preferably rigidly connected mutually, preferably the card receiving space being shape-retaining and/or configured to entirely contain the stack ; II- a card ejector, configured to be manually operated by a user and having an eject arm (6) within the housing, preferably opposite the card opening, configured to be moved or displaced, by manual actuation, by the card ejector, between a first, retracted, position and a second, extended, position, to bring the stack from an entirely inserted state in which the stack, preferably in a neat state, is entirely received within the card receiving space to an ejected state in which the stack through the card opening is partly slid, preferably as a staggered stack, from the housing, preferably for at least 10% of the stack length;

III- a card engaging device inside the housing for engaging a wall of the stack, preferably a side wall facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device configured to switch between a first and second engaging state, preferably by movement or displacement of the card engaging device, e.g. a stack releasing and a stack arresting state and/or a low and a, preferably at least 5 or 10% higher, high friction force provided on the stack, the card engaging device preferably comprising or provided by a friction element (6) opposing displacement of ejected cards in card ejection direction by gravity alone and/or a stack arresting element (21);

IV- an internal detector within the housing, for detecting at least part of the stack within the card receiving space, e.g. to detect a transition or switching of the stack from the entirely inserted to the ejected state, which detector (21) is preferably of pawl, probe, finger, stop or feeler type making, preferably direct, physical contact with a surface, preferably a side wall, of the stack;
- an internal elongated structural transmission arm (7) within the housing, that preferably extends along and/or spaced, preferably less than 2 or 5 millimetre, from a minor wall (32);
- wherein the detector (21) is mechanically coupled to the card engaging device (7) via the transmission arm to cause a switching between the first and second engaging state of the card engaging device by the transmission arm;
- the detector preferably is or comprises the stack arresting element.

2. A holder for a stack of cards comprising preferably at least one of:
part I of clause 1;
part II of clause 1;
- a card engaging device inside the housing for engaging a wall of the stack, preferably the wall facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device comprising a stack arresting element (21) inside the card receiving space and near or inside the card opening configured to displace between a stack releasing position, allowing the stack to pass the stack arresting element during ejection and a stack arresting position, retaining the stack entirely inside the card receiving space by physical obstruction and avoiding passage of the stack arresting element by the stack;
- the stack arresting element is configured as a, preferably internal, detector within the housing, for detecting at least part of the stack within the card receiving space and configured to detect a transition or switching of the stack from the entirely inserted to the ejected state, which detector is

preferably of pawl, probe, finger, stop or feeler type making, preferably direct, physical contact with a surface, preferably a side wall, of the stack;
- the card receiving space is provided inside an extruded body providing the main and minor walls and at least partly providing the housing; and/or
- a biasing element (7), preferably a leg shaped element, within the housing, being drivingly connected to and inwardly of the card receiving space, biasing the stack arresting element towards an inward position such that, in the ejected state of the stack and the eject arm in the extended position, the stack arresting element pushes against the stack under influence of the bias.

3. A holder for a stack of cards comprising preferably at least one of:
part I of clause 1;
part II of clause 1;
- a card engaging device inside the housing for engaging a wall of the stack, preferably the wall facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device preferably comprising a friction element (6) opposing displacement of ejected cards in card ejection direction by gravity alone;
- the card engaging device comprising a stack arresting element (21) inside the card receiving space, preferably near or inside the card opening, configured to displace, preferably at least 1 or 2.5 millimetre, between a stack releasing position, allowing the stack to pass the stack arresting element during ejection and a stack arresting position, retaining the stack entirely inside the card receiving space by physical obstruction and avoiding passage of the stack arresting element by the stack;
- the card receiving space is provided inside an extruded body providing the main and minor walls and at least partly providing the housing;
- the extruded body is internally provided with an extruded continuous longitudinal groove (11) in one or both main walls

at or near a minor wall providing a continuous enlargement or channel of the card receiving space in the direction from the first to the second main wall, at least a longitudinal or length part, preferably at least 10 or 20 millimetre long, of the card engaging device is located in the channel and has a width (W), measured from the first to the second main wall (31), such as to only fit inside the channel and/or is larger, preferably at least 0.4 millimetre, than the distance between the first and second main wall distal from the groove (11) and at least the stack arresting element of the card engaging device is located inside the channel at least in the stack releasing position,

the groove (11) has a depth, measured from the first to the second main wall, preferably of at least 0.2 or 0.5 millimetre and at the location of the groove (11) the distance between the first and second main walls (31) is expanded by this depth compared to said distance at a location away from the groove (11);

- the groove extends inward directly from the associated minor wall;

the card receiving space has a width (w) determined by the distance between the first and second minor walls;

wherein

A. for the groove at least one of the following applies:

- the groove is locally at least 5 or 10% or 1 millimetre enlarged or widened, preferably by processing, e.g. a milling technique, after extruding the body, in the direction from the first to the second minor wall at or near the card opening, preferably over a longitudinal distance of at least 2 and/or less than 10 or 30 millimetre, measured from the card opening;
- the, preferably exclusively extruded, groove has along its entire length a, preferably constant, width, as measured in the direction from the first to the second minor wall, which width is determined as:

    at least 3 or 3.5 and/or less than 6 or 8 millimetre; and/or

    at least 4.5 or 5 or 5.5 or 6% and/or less than 10 or 14% of the width of the card receiving space;

- the groove has a width such that both the widthwise (w) edge parts of a 54 millimetre wide card centred in the card receiving space, which edge parts are the exclusive or only parts of the card that are present inside the channel, e.g. illustrated in fig. 15, have a width, as measured in the direction from the first to the second minor wall, of at least 1.5 or 1.8 or 2.5% and/or less than 6 or 8 or 10% of the card width,
to provide a channel of the card receiving space such as to accommodate the stack arresting element inside the enlargement both in the stack releasing position and stack arresting position;
or
B. the card engaging device has a narrowing (B2) of at least 0.4 millimetre, preferably in the direction from the first to the opposite second main wall (31), at the location of the stack arresting element to allow the stack arresting element to leave the channel (11) in the direction from the first to the opposite second minor wall (32) when moving or displacing to the stack arresting position.

4. A holder for a stack of cards comprising preferably at least one of:
part I of clause 1;
part II of clause 1;
- a card engaging device inside the housing for engaging a wall of the stack, preferably the wall facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device comprising a leg shaped element (7) that extends longitudinally from the housing inside the card receiving space which carries
-a friction element (6) inside the card receiving space, opposing displacement of ejected cards in card ejection direction by gravity alone;
- a stack arresting element (21) inside the card receiving space and preferably near or inside the card opening configured to displace between a stack releasing position, allowing the stack to pass the stack arresting element during

ejection and a stack arresting position, retaining the stack entirely inside the card receiving space by physical obstruction and avoiding passage of the stack arresting element by the stack;

- the leg shaped element preferably retained, by retaining means, e.g. an edge (36) of a groove (11), of the card receiving space, within a longitudinally of the housing extending outward part of the card receiving space delimited by the associated minor wall.

5. A holder for a stack of cards comprising preferably at least one of:
part I of clause 1;
part II of clause 1;

- a card engaging device inside the housing for engaging a wall of the stack, preferably the wall facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device comprising a leg shaped element (7) extending longitudinally of the housing inside the card receiving space or provided inside the housing along the card receiving space, the leg shaped element is associated with and/or extending along the first minor wall and having a first longitudinal end located at or near the card opening, which carries

- a stack arresting element (21), e.g. inside the card receiving space, and preferably near or inside the card opening configured to displace between a stack releasing position, allowing the stack to pass the stack arresting element during ejection and a stack arresting position, retaining the stack entirely inside the card receiving space by physical obstruction and avoiding passage of the stack arresting element by the stack;

the stack arresting element is located at or near the first longitudinal end of the leg shaped element, wherein a first length part of the leg shaped element, extending from the first longitudinal end and carrying the stack arresting element, is

- curved or angled, preferably at least 5 or 10 or 15 or 20 and/or less than 30 or 35 or 40 degrees relative to the immediately joining length part of the leg shaped element; and/or
- diverges away from the first minor wall, as viewed along the leg shaped element in the direction of the first longitudinal end;

in inward direction of the card receiving space and/or towards the opposite second minor wall of the card receiving space; which first length part preferably has a length of at least 2 and/or less than 10 or 15 millimetre.

6. Holder according to any of the preceding clauses in combination with at least one of the other preceding clauses.

7. Holder according to any of the preceding clauses, wherein the transmission arm (7)

is movable and/or displaceable, preferably guided, along the minor wall (32) of the card receiving space; and/or

is an elongated part, e.g. a leg, e.g. plate like, of, or provides, the card engaging device positioned along the minor wall (32) of the card receiving space, said part connecting or carrying the stack arresting element (21) and the friction element (6), wherein preferably the part (7) is positioned against, more preferably pushes against, the first minor wall (32), preferably at a, preferably local, area (34), e.g. a tilting area (34) to be tiltable, to provide a bias on the stack arresting element (21) and/or the friction element (6) towards the opposing second minor wall (32).

8. Holder according to any of the preceding clauses, wherein for the detector (6, 21) one or more of the following applies:

is a mechanical detector;

is or has or is provided at, preferably the distal or free end of, a, preferably biased, arm (33) that extends and/or is

biased into the card receiving space, preferably extending from the minor wall (32) into the card receiving space;

is decoupled from or lacks a direct mechanical coupling with the card ejector (16);

comprises a tiltable, preferably at a, preferably local, area (34), e.g. a tilting area (34), leg or strip (33);

is formed by:

a stack arresting element (21) positioned at or near the card opening (3) of the card receiving space, the stack arresting element is preferably arranged to hold the cards in the entirely inserted state, the stack arresting element having an arresting part that can move or displace in and out of a path for inserting the stack of cards into the card receiving space; and/or a friction element (6), arranged to engage a, preferably side, wall of the stack of cards (2);

is arranged such that one or more of the following applies: in the entirely inserted state of the stack of cards, cause a stack arresting element (21) in a position in a path for ejection of the stack of cards;

in the partly ejected state of the stack of cards cause a bias on a stack arresting element (21) that is higher or lower than a bias caused in the entirely inserted state of the stack of cards;

as a result of a transition from the entirely inserted state to the partly ejected state of the stack of cards cause a bias, preferably a bias on a friction element (6), to be increased;

as a result of a transition from the partly ejected state to the entirely inserted state cause a bias, preferably a bias on a friction element (6), to be reduced;

as a result of a transition from a non inserted state to a partly inserted state cause a bias, preferably a bias on a stack arresting element (21), to be increased, preferably from a relaxed state to a tensioned state;

wherein preferably one or more of the above increases or reductions is more than 10%, more than 20%, most preferably more than 50%;

9. Holder according to any of the preceding clauses, wherein the card engaging device comprises one or more of:

at least one biased element arranged to bias the card engaging device, or part of it, e.g. a friction element (6) and/or a stack arresting element (21), towards a, preferably side, wall of the stack of cards and/or in a direction from the first towards the opposing second minor wall;

at least a friction element (6), arranged to engage a, preferably side, wall of the stack of cards;

a stack arresting element (21) positioned at or near the card opening (3) arranged to hold the stack of cards in the entirely inserted state, the stack arresting element having an arresting part that can move or displace in and out of a path for insertion of the stack of cards into the card receiving space;

at least an elongated support (7) that extends within the housing along the minor wall (32) of the housing, wherein for the elongated support at least one of the following applies:
extends along the first minor wall of the housing in the entirely inserted state and in the partly ejected state of the stack of cards;
projects towards the opposing second minor wall;
is formed from a resilient flexible material, such as a sheet material, e.g. metal, preferably formed, e.g. folded or rolled or pressed,
one or more of the biased element, the friction element (6), the elongated support (7), the stack arresting element (21) form the detector;
one or more of the biased element, the friction element, the elongated support, the stack arresting element are coupled via the transmission arm to the detector.

10. Holder according to any of the preceding clauses, wherein the card engaging device comprises a stack arresting element (21) positioned at or near the card opening (3) arranged to hold or lock the stack of cards in the entirely inserted state,

wherein the stack arresting element preferably has one or more of:
- is biased into a track of the cards, preferably by a biased arm, more preferably coupled to the transmission arm;
- is coupled via the transmission arm to the detector, and
wherein the detector is preferably arranged to:
- in the entirely inserted state of the stack of cards, cause a force on a stack arresting element that holds the stack arresting element in a position in a track of the card stack; and/or
- in the partly inserted state of the stack of cards cause a bias on the stack arresting element (21) that is higher or lower than a bias caused in the entirely inserted state; and/or
- as a result of a transition from a non inserted state to a partly inserted state of the stack of cards cause a bias, preferably a bias on the stack arresting element, to be increased, preferably from a relaxed state to a tensioned state; wherein preferably one or more of the above increases or reductions is more than 10%, more preferably more than 20%, most preferably more than 50%;
- comprises a projection (21) positioned at or near the card opening (3) of the card receiving space, preferably at or near a distal end of the minor wall as viewed from the ejector device, projecting from the first minor wall to the opposing second minor wall and positionable in a track of the cards;
- and a second stack arresting element are positioned at or near the card opening of the card receiving space on two opposing minor walls of the housing.

11. Holder according to any of the preceding clauses, wherein the card engaging device comprises at least a friction element (6) arranged to engage a, preferably side, wall of the stack of cards, preferably in the partly inserted state and/or the entirely inserted state, wherein preferably one or more of the following applies:
the card engaging device is arranged along a minor wall (32) of the card receiving space;

at least a part of the card engaging device is formed from a leg or, preferably metal, sheet;
the friction element (6) is mounted on a friction arm (7) of the card engaging device;
the friction arm (7) that supports the friction element (6) and preferably one or more of the transmission arm and the stack arresting element (21) is integrally formed from the leg or sheet.

12. Holder according to any of the preceding clauses, wherein one or more of the following applies:
in the partly ejected state the cards of the stack are in staggered positions;
the card opening is formed by the ends of the two opposing main walls (31) and the two opposing minor walls (32), preferably having a rectangular shape;
the housing is at the inner side, preferably at the minor wall (32), provided with one or more grooves (11) in a main wall, into which preferably the at least a part of the card engaging device and/or the transmission arm is located;
the housing is provided with a groove (11) in an main wall (31) at or near the card opening (3), in which the stack arresting element (21) can be received;
the housing retains its outer shape in a not inserted state, a partly inserted state, the partly ejected state and the entirely inserted state of the stack of cards.

13. Holder according to any of the preceding clauses, wherein the card ejector is preferably generally positioned at the end of the housing opposing the card opening (3) of the card receiving space, wherein preferably the card ejector comprises one or more of:
- a card ejector arm (16) that is movable or displaceable, preferably pivotable, internally with respect to the housing and/or having stepped elements (19) for ejecting the cards of the stack in a staggered manner;

- a user operating button (18) positioned outside the housing and drivingly coupled to a card ejector arm.

14. Holder according to any of the preceding clauses, wherein the stack arresting element (21) is arranged to take a stack arresting position to obstruct a path that is followed by the stack during ejection of the entirely inserted state of the stack from the card receiving space; and/or to take a stack releasing position to cancel said obstruction, wherein preferably the stack arresting element is arranged
- to be biased by biasing means of the holder into the stack arresting position and/or
- to be brought from the stack arresting position into the stack releasing position by the stack during ejection by the card ejector wherein the stack preferably pushes the stack arresting element out of the path against the bias provided by the biasing means.

15. Holder according to any of the preceding clauses, wherein at least one of the following applies:
the stack arresting element (21) is coupled to or provided by or supported by or part of the card engaging device;
the stack arresting element (21) comprises a projection that extends from the first minor wall (32) of the card receiving space towards the opposing second minor wall, wherein the projection can move or displace in a direction from the first towards the opposite second minor wall;
the card opening (3) of the card receiving space is generally rectangular shaped and the stack arresting element (21) is positioned on or at an inner side of the card opening, preferably entirely internal in the card receiving space;
the stack arresting element (21) is embodied by a metal part, preferably formed from a metal sheet, preferably a curl shaped metal part, e.g. obtained by forming, e.g. rolling, folding or pressing, preferably curled over more than 135 degrees;
the stack arresting element (21) is formed, e.g. by rolling or folding or pressing, a sheet metal forming a rim as distal

or free end of the stack arresting element (21) that fixates a friction element (6) extending away from the distal or free end of the stack arresting element along the sheet metal, the sheet metal (7), stack arresting element (21), and/or friction element (6) providing at least part of the card engaging device;
the stack arresting element (21) is formed from or provided by a body, e.g. metal sheet and/or wherein a distal end (21) of the body (33), that forms the stack arresting element (21), is at least 10% or 0.5 millimetre less wide than the directly adjacent part, viewed longitudinally, of the body or card engaging device;
the stack arresting element (21) is provided by a, preferably inward into the card receiving space projecting, protrusion of the card engaging device (7), preferably by forming, e.g. rolling or pressing or folding, an end of a sheet part of the card engaging device.

16. Holder according to any of the preceding clauses, wherein the stack arresting element (21) is coupled to the card engaging device via a transmission arm to cause a change, e.g. increase or decrease, in engagement, e.g. pushing force, preferably at least 5 or 10%, by the card engaging device, e.g. the friction element (6), onto the stack of cards in the partly ejected state of the stack of cards compared to the entirely inserted state in the card receiving space.

17. Holder according to any of the preceding clauses, wherein the card engaging device comprises at least a friction element (6) arranged to engage a, preferably side, wall of the stack of cards, wherein preferably at least one of the following applies:
the friction element (6) is clamped or fixed by the stack arresting element (21);
the card engaging device (7) is arranged along a minor wall (32) of the card receiving space;
the friction element (6) is mounted on a friction arm (7) of the card engaging device;

at least a part of the card engaging device is formed from a leg or, preferably metal, sheet, wherein preferably a friction arm (7) that supports the friction element (6) and preferably one or more of the transmission arm and the card arresting element (21) are integrally formed from or provided by the leg or sheet;
the friction element (6) is coupled via the transmission arm (7) to the stack arresting element (21) that is arranged as the detector to cause one or more of:

- as a result of a transition from the entirely inserted state to the partly ejected state of the stack of cards, a bias, preferably a bias on the friction element, to be changed, e.g. to be increased;
- as a result of a transition from the partly inserted state to the entirely inserted state of the stack of cards, a bias, preferably a bias on the friction element, to be changed, e.g. to be reduced;
- as a result of a transition from a non inserted state to a partly inserted state of the stack of cards, a bias, preferably a bias on the friction element (6), to be changed, e.g. to be increased,

wherein preferably one or more of the above changes or increases or reductions is more than 10%, more preferably more than 20%, most preferably more than 50%.

18. Holder according to any of the preceding clauses, wherein the stack arresting element (21) projects into the widening (35) of the groove (11) when the stack of cards is in the entirely inserted state and/or is outside the widening (35) when the stack of cards is in the partly ejected state; and/or in the entirely inserted state of the stack of cards the stack arresting element opposes displacement of ejected cards in card ejection direction at least by gravity alone, e.g. by physical or mechanical interference rather than friction.

19. Holder according to any of the preceding clauses, wherein at least one of the following applies:

at one or both minor walls (32)of the card receiving space, an, e.g. extruded, groove, providing an extruded channel (11), is located or provided, preferably in one or both main walls (31), preferably at directly opposite locations;
the extruded channel is in communication with or is connected to the card receiving space;
at the location of the extruded channel the distance between the main walls of the housing is enlarged due to the grooves.

20. Holder according to any of the preceding clauses, wherein the front wall, facing the stack of cards, of the card engaging device (7) comprises a friction element (6), wherein the friction element is connected to the card engaging device (7), e.g. the elongated support, preferably glued or clamped by the stack arresting element (21); and/or the friction element is provided by or has a surface of: fibre like material and/or a textile material, such as a woven or non woven, natural or synthetic fibre material, such as felt and/or foam or rubber or elastomer.

21. Holder according to any of the preceding clauses, wherein one or more of the following applies:

the elongated support is formed from or provided by a resilient flexible material, such as a sheet material, e.g. metal, preferably spring steel, preferably having a thickness at least 0.05 and/or not more than 0.3 or 0.5 millimetre and/or a width at least 4 and/or less than 7 or 10 millimetre;

the elongated support is formed, e.g. rolled or pressed or folded, perpendicular to a long wall of the elongated support to provide a first fold or bend or curve, preferably at least 1 and/or less than 20 or 30 degrees;

the front side of the elongated support, facing inwards of the card receiving space, has a convex shape and the front side of the first fold or bend or curve is the part of the front side engaging the, preferably side, wall of the stack of cards and/or supporting the friction element (6);

parts of the elongated support on one or both sides, viewed longitudinally, of the first fold or bend or curve, preferably immediately adjacent the first fold or bend or curve, form bias elements that bias the front side of the first fold or bend or curve towards inwards of the card receiving space and/or towards the, preferably side, wall of the stack of cards;

the elongated support is formed, e.g. rolled or pressed or folded, perpendicular to a long wall of the elongated support to provide a second fold or bend or curve, preferably at least 1 or 5 and/or less than 20 or 30 degrees;

the front side of the elongated support, facing inwards of the card receiving space, has a concave shape and a part of the front side, e.g. of the second fold or bend or curve, engages the, preferably side, wall of the stack of cards and/or supports the friction element (6);

on the one side, viewed longitudinally, of the second fold or bend or curve, preferably immediately adjacent, there is provided the stack arresting element;

on the other side, viewed longitudinally, of the second fold or bend or curve, preferably immediately adjacent, there is provided the friction element (6);

the front side of the elongated support has a convex and a concave part, provided by the first and second fold or bend or curve, wherein the convex part is arranged to engage the, preferably side, wall of the stack of cards and/or supports the friction element (6) and wherein the concave part is positioned between convex part and the stack arresting element (21).

22. Holder according to any of the preceding clauses, wherein the stack arresting element is designed to engage a wall area of the stack facing in the direction of ejecting the stack, e.g. the side wall of the stack facing in the direction of ejecting the stack, preferably the stack arresting element is designed to engage the wall area of the stack provided by the rounded corners of the cards that are stacked onto each other in a neat stack wherein the cards are mutually registered.

23. Holder according to any of the preceding clauses, wherein the stack arresting element (21) and the friction element (6) are supported by and/or fixed to an elongated support (7), each at a side of a tilting feature (34)wherein the elongated support (7) has sufficient flexural rigidity or stiffness such that a diverging movement, or attempt for it, of the stack arresting element (21) causes pivoting of the elongated support (7) at the tilting feature (34)resulting in an opposite diverging movement, or attempt for it, of the friction element (6), or vice versa, wherein preferably the tilting feature (34) is provided by a local area (34) of the elongated support (7) positioned against, more preferably pushing against, the first minor wall (32).

24. Holder for a stack of cards, e.g. according to ISO/IEC 7810 ID-1 and/or ISO/IEC 7813, possibly according to any of the preceding clauses, comprising preferably one or more of the following:
a rectangular, sleeve like housing (1) having two opposite mutually parallel and spaced main sides/walls (31) connected and spaced by two long and two short opposite minor sides/walls (32), the walls (31, 32) delimiting the receiving space of the housing to receive the stack of cards within the housing, wherein the distance (t) between the main walls (31) determines the maximum stack height/thickness and the distance (l) between the short minor sides (32) determines the maximum stack length and the distance (W) between the long minor sides (32) determines the maximum stack width of the stack of cards received within the housing,
which housing tightly fits around a stack of at least three cards (2) and the one short minor side (32) has a card opening (3) for locating and removing cards, such that the movement of the cards through the opening (3) out and in the housing is limited to a movement of their top face parallel to the main sides (31) of the housing and in longitudinal (L) direction of the housing, and the opposite short minor side and both long

minor sides are closed such as to avoid a card from passing said side,
wherein at or within the housing, preferably opposite the card opening (3), a card eject feature is provided such that the cards through the card opening (3) can be partly slid from the housing, which card eject feature preferably comprises an ejector arm (16) which is designed to move, e.g. pivot, within the housing relative to the opening (3) between a first and a second position and during said movement ejects the cards by engaging and forcing the cards simultaneously to partly exit the housing, preferably to move the cards mutually parallel and to mutually stagger the cards longitudinally while ejecting the cards,
the ejector arm (16) preferably having a longitudinal side provided with a stepped shape provided by longitudinally spaced steps, preferably at least six in number, preferably each step having a height between 0.2 and 0.6 millimetre, and each step designed to engage a single card of the step, such that each card is moved further outward relative to the adjacent card;
an actuator, e.g. finger button, is provided, preferably projecting outside the housing, configured to actuate the ejector arm (16) to move between the first and second position;
wherein at the inner side of the housing, possibly near the card opening (3) at at least one long minor side (32) a contacting or gripping element, e.g. a friction element (6), which is separate from the sides/walls of the housing, is located which is designed to be in direct contact with and to exert a contacting or gripping, e.g. friction, force to the contacting narrow side, defining the card thickness (T), of an or each individual card which is at least partly present in the housing, preferably resulting in providing an or each relative card such a stable position relative to the housing, that the card can not slide due to gravity, but indeed due to a force exerted by the finger tips;
wherein the design is such that of an in the card holder located card stack, the by the thin sides of the cards provided side of the stack is urged against the surface of the contacting

or gripping, e.g. friction, element (6) by a parallel to the main side (31) of the housing active urging force which is preferably generated by pressing means (7) of the card holder, which means (7) are separate from the sides/walls of the housing, which urging force is directed in the widthwise (W) direction of the cards and parallel to the main sides (31); and the surface (12) of the contacting or gripping, e.g. friction, element (6) for e.g. friction engagement with the thin sides of the cards faces a long minor side (32)
and wherein the receiving space is provided with retaining means, e.g. both the opposite main sides (31) have mutually opposite obstructing means, e.g. surface grooves, near and parallel to each long minor side with, e.g. into, which obstructing means, e.g. grooves, the opposite edges of the contacting or gripping, e.g. friction, element (6) engage, e.g. are located, such that said retaining means, e.g. grooves, delimit movement of the element (6) in the widthwise direction (W) of the housing to a maximum of 5 millimeter, preferably said retaining means, e.g. grooves, locally change, e.g. increase, the distance between the opposing main sides (31)
the friction element (6) is associated with movement means of the housing to selectively generate a movement of the friction element (6) or at least its friction surface (12) in thickness direction of the friction element (6), which is the direction in which the friction element is urged against the stack, which also is the widhtwise direction (W).

25. Holder according to any of the preceding clauses, the design is such that by the movement means the force with which the friction element (6) is urged against the cards varies at least 10 or 20%.

26. Holder according to any of the preceding clauses, the friction element is mounted to urging means (7) and is located between and is elastically compressed between the urging means (7) and the one long side of the stack and thus has become thinner due to the compression and will retain its original thickness

if the stack is removed.

27. Holder according to any of the preceding clauses, wherein the movement and/or actuation of the ejector arm is free from a mechanical coupling or engagement with the movement and/or actuation of the friction element.

28. Holder according to any of the preceding clauses, the housing contains two friction elements (6) opposite each other, each adjacent a long minor side (32), located such that if the cards stack is inserted in the housing they squeeze the cards stack between them in widthwise direction (W) and engage the thin side of each individual card.

29. Holder according to any of the preceding clauses, wherein one or more of the following applies:
- the card eject feature comprises a stepped element (19), which can by the user be moved relative to the housing against the side of the within the housing present card stack, resulting that this stack in a stepped format partly moves outside the housing;
- the thickness of a part of the steps of the stepped element (16) measures at least 0.2 millimetre, e.g. approx. 0.4 mm;
- the card remove feature, e.g. stepped element (16) is provided with a reset means, e.g. spring (20).
- the layered structure comprises at least two or three or four or five layers of different material, preferably in thickness direction viewed;
- of all cards within the stack the main dimensions suffice ISO 7810;
- of all cards within the stack the thickness and/or roundings suffice ISO 7813;
- the space of the holder to contain the stack of cards has one or more of the following dimensions (in millimetre): width at least 50 or 52 and/or not more than 55 or 60; length at least 80 or 83 or 84 and/or not more than 86 or 87 or 90; height at least 3 or 4.5 and/or not more than 8 or 10.

30. Holder according to any of the preceding clauses, wherein the friction element (6) has a surface with one or more of the following features: of sufficient width/dimension to simultaneously engage all cards in the stack; is not rigid; is locally easily, preferably elastically, compressible; in which easy preferably elastically, a relief or surface profile or irregular surface can be made; in which easy, preferably elastically, one or more grooves or pits can be made; is deformable comparable to the surface of a wadded pillow or felt layer; locally yields easily; is easy, preferably elastically, deformable; easy adapt its shape to the shape, such as relief or profile or irregularity, of the surface of the side of a card stack.

31. Card holder according to any of the preceding clauses, with one or more of the following:

- the friction element engages preferably elastically yielding the side of a card stack;
- the surface of the friction element, engaging the card stack, is facing the direction parallel to the top face of the card holder or housing (1);
- the friction element extends substantially the complete height of the receiving space of the housing (1) to contain the card stack;
- the receiving space is sleeve or shaft like;
- the receiving space is designed such that the cards through the card opening parallel to their top face must be slid from this space;
- the receiving space is delimited by a top face and a back face and two opposite sides connecting the top and back face and which boundary provides a rigid housing, and wherein the top face has a dimension substantially equal to the dimension of the top face of the within the receiving space to be located card, possibly having a width equal to the card width plus the width required to accommodate the friction element (6) and possibly the pressing means (7) at one or both sides;

- the friction element engages the side of a card as soon as the card is inserted into the card holder for only one half or one third or a quarter or one fifth or one tenth of its length and from that point maintains its engagement while the card is further inserted;
- the holder comprises an external actuating feature, e.g. finger button (18), to provide the force to eject the cards by the card eject feature;
- in the receiving space a stack of at least three right angled cards, mutually registered, with substantially identical dimensions and each with a first side and an opposite second side, and the friction element in retaining engagement, in the direction of sliding out the card opening, with the to the friction element facing side of each card and the card sideways preloading such that the second side of each card is pressed against and retained by the side of the receiving space, while the distance between the first and second side of the one card is unequal to the same distance of a different card in the stack;
- the friction element (6) is a pad like object and/or is spaced from the minor sides (32) of the housing;
- the urging means (7) have a length at least twice or three or four times the length of the friction element, measured in the longitudinal direction (L).

32. Card engaging device or leg shaped element or elongated support for a holder according to any of the preceding clauses or separated or extracted from a holder according to any of the preceding clauses, preferably supporting the friction element and/or the stack arresting element.

33. A holder for a stack of cards possibly according to any of the preceding clauses, comprising a leg having locally a mechanical boss (i.e. boss) projecting from the leg at least 0.1 or 0.2 millimetre at its face facing the associated minor side and the boss preferably having one or more of: supported and/or contacted by a minor side; located at a distance of at

least 3 or 5 or 7 millimetre and/or less than 40 or 35 or 30 or 15 or 10 millimetre from the distal longitudinal end (adjacent the card opening) of the leg, which distal longitudinal end preferably carries a mechanical probe or projection or sensor; located at the side of a tilting area opposite the side facing the mechanical probe or projection or sensor; provided by an impression or embossing or indentation of the leg; covering at least 50% and/or less than 95% the width of the leg; ends remote from the longitudinal edges of the leg; the dimension in leg longitudinal direction is at least 0.5 and/or less than 5 or 3 or 2 millimetre; covered by the friction pad, preferably completely, more preferably the friction pad extends at least 3 or 5 millimetre beyond the boss in one or both longitudinal leg directions; elongated shape; long dimension perpendicular to the length direction of the leg; two are present, mutually spaced in leg longitudinal direction at least 5 or 10 millimetre and/or less than 30 or 40 millimetre.

34. A holder for a stack of cards, possibly according to any of the preceding clauses, provided with a leg having a thinned or recessed area or length part, commonly named zone, preferably thinned or recessed at least 0.5 or 1 and/or less than 2, 3, 4 or 5 millimetre and preferably one or more applies to the zone: extending from the leg outer surface preferably over the complete zone length; located at a distance of less than 40 or 35 or 30 millimetre from the distal longitudinal end of the leg, which distal longitudinal end preferably carries a mechanical probe or projection or sensor; provided at the leg side facing the associated holder minor side, or the opposite side, or both said sides; covering at least 50% or 100% the width of the leg; its dimension (i.e. length) in leg longitudinal direction is at least 1 or 3 or 5 or 10 or 15 and/or less than 50 or 60 millimetre; located at the side of a tilting area opposite the side facing the mechanical probe or projection or sensor; covered by the friction pad, preferably the friction pad is only present at the zone and/or absent outside the zone. Such zone allows deflection of the leg, particularly of the

zone.

35. Holder according to any of the preceding clauses in combination with any of the attached claims.

36. Holder according to any of the preceding clauses in combination with any of the features or measurements disclosed in the above specification.

CLAIMS

1. A holder for a stack of cards comprising:

a housing (1), having a card receiving space provided between opposite, mutually spaced first and second main walls (31), which determine a maximum thickness of the stack (2) between them and opposite, mutually spaced first and second minor walls (32), perpendicular to the main walls and joined with the main walls, the main walls configured for a tight fit of the height of a stack of at least three cards between them, the minor walls configured to accommodate the width (W) of the stack between them, the housing having at least one card opening (3) for inserting and ejecting the stack into and from the card receiving space;

a card ejector, configured to be manually operated by a user and having an eject arm (6) within the housing, configured to be moved, by manual actuation, by the card ejector, between a first, retracted, position and a second, extended, position, to bring the stack from an entirely inserted state in which the stack is entirely received within the card receiving space to an ejected state in which the stack through the card opening is partly slid from the housing;

a card engaging device inside the housing for engaging a side wall of the stack facing a minor wall, in the ejected state and/or in the entirely inserted state, the card engaging device comprising or provided by a friction pad (6) opposing movement of the stack in stack ejection direction and configured to switch between a first and second engaging state providing a low and a high friction force, respectively, provided on the stack;

an internal detector within the housing, for detecting at least part of the stack within the card receiving space, e.g. to detect a transition or switching of the stack from the entirely inserted to the ejected state, which detector (21) is making physical contact with a surface of the stack;

an internal elongated structural transmission arm (7) within the housing;

wherein the detector (21) is mechanically coupled to the card engaging device via the transmission arm (7) to cause a switching between the first and second engaging state of the card engaging device by the transmission arm as a result of the detector (21) detecting the stack.

2. Holder according to claim 1, wherein the detector is a stack arresting element (21) inside the card receiving space and near or inside the card opening (3) and configured to move between a stack releasing position, allowing the stack (2) to pass the stack arresting element during ejection and a stack arresting position, retaining the entirely inserted stack entirely inside the card receiving space by physical obstruction and avoiding that the stack passes the stack arresting element (21).

3. Holder according to claim 1 or 2, wherein the stack arresting element (21) is configured to move at least 1 or 2.5 millimetre, between the stack releasing position and the stack arresting position, in the direction (W) from the one minor side to the opposing minor side of the holder, i.e. the widthwise direction (W) of the holder.

4.Holder according to any of the preceding claims, wherein the stack arresting element (21) moves from the stack releasing position to the stack arresting position, or vice versa, due to elastic resilient flexing of the leg shaped element (7).

5. Holder according to any of the preceding claims, wherein the card engaging device comprising a leg shaped element (7) that extends longitudinally from the housing inside the card receiving space and adjacent a minor wall (32) which provides the transmission arm and carries the friction pad (6) and the stack arresting element (21).

6. Holder according to any of the preceding claims, wherein the leg shaped element (7), the stack arresting element (21) and the friction pad (6) are retained in a channel (11)

of the card receiving space, said channel is provided between a minor wall (32) of the holder and a boundary (36) remote from said minor wall (32), said boundary (36) retaining the leg shaped element (7), the stack arresting element (21) and the friction pad (6) to enter the card receiving space beyond said boundary (36), the dimension of the channel in widthwise direction (W) of the holder is preferably less than 5 millimetre or 10% of the dimension of the card receiving space in widthwise direction (W) of the holder.

7. Holder according to claim any of the preceding claims, wherein the leg shaped element (7) is present in a continuous longitudinal groove (11) in one or both main walls (31) providing a continuous enlargement or channel of the card receiving space in the direction from the first to the second main wall, and also the friction pad (6) and the stack arresting element are located inside the channel, wherein the groove is locally at least 5 or 10% or 1 millimetre enlarged or widened in the direction from the first to the second minor wall at or near the card opening, preferably over a longitudinal distance of at least 2 and/or less than 10 or 30 millimetre, measured from the card opening; to provide a channel of the card receiving space such as to accommodate the stack arresting element inside the enlargement both in the stack releasing position and stack arresting position (viz. fig. 17 + 18).

8. Holder according to any of the preceding claims, wherein the card engaging device has a narrowing (B2) of at least 0.4 millimetre, preferably in the direction from the first to the opposite second main wall (31), at the location of the stack arresting element (21) to allow the stack arresting element to leave the channel (11) in the direction from the first to the opposite second minor wall (32) when moving to the stack arresting position (viz. fig. 19 + 24).

9. Holder according to any of the preceding claims, comprising a leg shaped element (7) associated with and/or

extending along the first minor wall and having a first longitudinal end located at or near the card opening, which carries the stack arresting element (21) which is located at or near the first longitudinal end of the leg shaped element,
wherein a first length part of the leg shaped element, extending from the first longitudinal end and carrying the stack arresting element, is
- curved or angled, preferably at least 5 or 10 or 15 or 20 and/or less than 30 or 35 or 40 degrees relative to the immediately joining length part of the leg shaped element; and/or
- diverges away from the first minor wall, as viewed along the leg shaped element in the direction of the first longitudinal end;
in inward direction of the card receiving space and/or towards the opposite second minor wall of the card receiving space; which first length part preferably has a length of at least 2 and/or less than 10 or 15 millimetre.

10. Holder according to any of the preceding claims, wherein the transmission arm (7) is an elongated part, e.g. a leg, e.g. plate like, of, or provides, the card engaging device positioned along the minor wall (32) of the card receiving space, said part (7) connecting or carrying the stack arresting element (21) and the friction pad (6), wherein the part (7) is positioned against, more preferably pushes against, the first minor wall (32), at a local tilting area (34)of the part (7) to be tiltable, such that if the stack arresting element (21) moves away from the opposing second minor wall (32) the friction pad (6) simultaneously and correspondingly moves towards the opposing second minor wall (32) by tilting of the transmission arm (7) at the tilting area (34) located between the friction pad (6) and the stack arresting element (21).

11. Holder according to any of the preceding claims, wherein the leg (7) and the stack arresting element (21) are commonly provided as a one-piece or single piece.

12. Holder according to any of the preceding claims, wherein the stack arresting element (21) is embodied by a curl shaped metal part, formed from a metal sheet, obtained by forming, e.g. rolling, folding or pressing, curled over more than 135 degrees.

13. Holder according to any of the preceding claims, wherein the stack arresting element (21) is coupled to the friction pad (6) via a tilting area (34) to cause an increase in pushing force, preferably at least 5 or 10%, by the friction pad (6) onto the stack of cards in the partly ejected state of the stack of cards compared to the entirely inserted state in the card receiving space, in that if the stack arresting element (21) moves away from the opposing second minor wall (32) the friction pad (6) simultaneously and correspondingly moves towards the opposing second minor wall (32) by tilting of the tilting area (34).

14. Holder according to any of the preceding claims, wherein in the entirely inserted state of the stack of cards the stack arresting element opposes movement of ejected cards in card ejection direction at least by gravity alone, by physical or mechanical interference rather than friction.

15. Holder according to any of the preceding claims, wherein the leg shaped element (7) is formed from or provided by a resilient flexible material, such as a sheet material, e.g. metal, preferably spring steel, preferably having a thickness at least 0.05 and/or not more than 0.3 or 0.5 millimetre and/or a width at least 4 and/or less than 7 or 10 millimetre.

16. Holder according to any of the preceding claims, wherein the stack arresting element (21) and the friction pad (6) are supported by and/or fixed to a leg shaped element (7), each at a side of a tilting feature (34) wherein the leg shaped element (7) has sufficient flexural rigidity or stiffness such that a diverging movement, or attempt for it, of the stack

arresting element (21) causes pivoting of the leg shaped element (7) at the tilting feature (34) resulting in an opposite diverging movement, or attempt for it, of the friction pad (6), or vice versa, wherein the tilting feature (34) is provided by a local area (34) of the leg shaped element (7) positioned against, more preferably pushing against, the first minor wall (32).

17. Holder according to any of the preceding claims, comprising a leg shaped element (7) having a thinned or recessed area or length part, commonly named zone, preferably thinned or recessed at least 0.5 or 1 and/or less than 2, 3, 4 or 5 millimetre and preferably one or more of the following applies to the zone: extending from the leg outer surface preferably over the complete zone length; located at a distance of less than 40 or 35 or 30 millimetre from the distal longitudinal end of the leg, which distal longitudinal end carries a mechanical probe (21) or projection or sensor; located at the side of a tilting area (34) opposite the side facing the mechanical probe or projection or sensor; covered by the friction pad (6) (viz. fig. 29 + 33).

18. Holder according to any of the preceding claims, wherein one or more of the following applies:

the housing (1) is extruded;

the housing (1) having a flat and/or oblong card receiving space, of preferably rectangular box or cuboid or sleeve shape;

the main and minor walls are rectangular shaped;

inserting and ejecting the stack into and from the card receiving space such that the stack is slid in and out the holder parallel to the main and minor walls;

the main and minor walls are rigidly connected mutually;

the card receiving space being shape-retaining and/or configured to entirely contain the stack ;

the eject arm (16) is provided opposite the card opening (3);

the stack in the entirely inserted state as a neat stack and/or in the ejected state as a staggered stack;

in the ejected state the stack is slid from the housing for at least 10% of the stack length;

the card engaging device configured to switch between a first and second engaging state by movement of the card engaging device;

the high friction force is at least 5 or 10% higher;

the detector configured to detect a transition or switching of the stack from the entirely inserted to the ejected state;

the detector (21) is of pawl, probe, finger, stop or feeler type;

the detector making direct, physical contact with a surface, preferably a side wall, of the stack;

the transmission arm (7) and/or leg shaped element (7) extends along and/or spaced, preferably less than 2 or 5 millimetre, from a minor wall (32);

the friction pad (6) opposing movement of ejected cards in card ejection direction by gravity alone;

the transmission arm (7) is part of or is provided by the leg shaped element (7);

the first and second engaging state provide the friction pad (6) a low and high pushing force against the stack, yielding said low and high friction force, respectively;

the high friction force provide an increase of the force opposing movement of the stack inside the holder;

the leg shaped element (7) has a convex and a concave length part and/or an S-like shape;

the convex length part carries the friction pad;

the concave length part is located between the convex length part and the stack arresting element (21);

of the leg shaped element (7), the length part that carries the friction pad (6) makes an angle, preferably at least 20 and/or less than 40 degrees, with the length part (33) that carries the stack arresting element (21) and between these length parts the tilting area (34) is present.

Abstract

A holder for cards, comprising a housing which tightly fits around a stack of at least three cards and has a card opening for locating and removing cards, while within the housing, opposite the card opening, a card eject feature is provided such that the cards through the card opening can be partly slid from the housing. At the inner side of the housing a friction element is located to provide the cards a stable position inside the housing. The friction element (6) is associated with movement means of the housing to selectively generate a movement of the friction element (6) or at least its friction surface (12) in thickness direction of the friction element (6), which is the direction in which the friction element is urged against the stack, which also is the widhtwise direction (W).