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(54) Device for controlling the speed of passage of discoidal elements

(57) The device comprises a cylindrical member arranged with a given inclination relative to the horizontal, facing the inlet for discoidal elements, bringing about point-form contact between the control member and the discoidal piece for the purposes of regularising the reduction of the kinetic energy of an incoming discoidal piece, and also the speed of displacement along the path for the discoidal pieces, which path is determined by an inclined guide arranged as a continuation of the cylindrical control member.

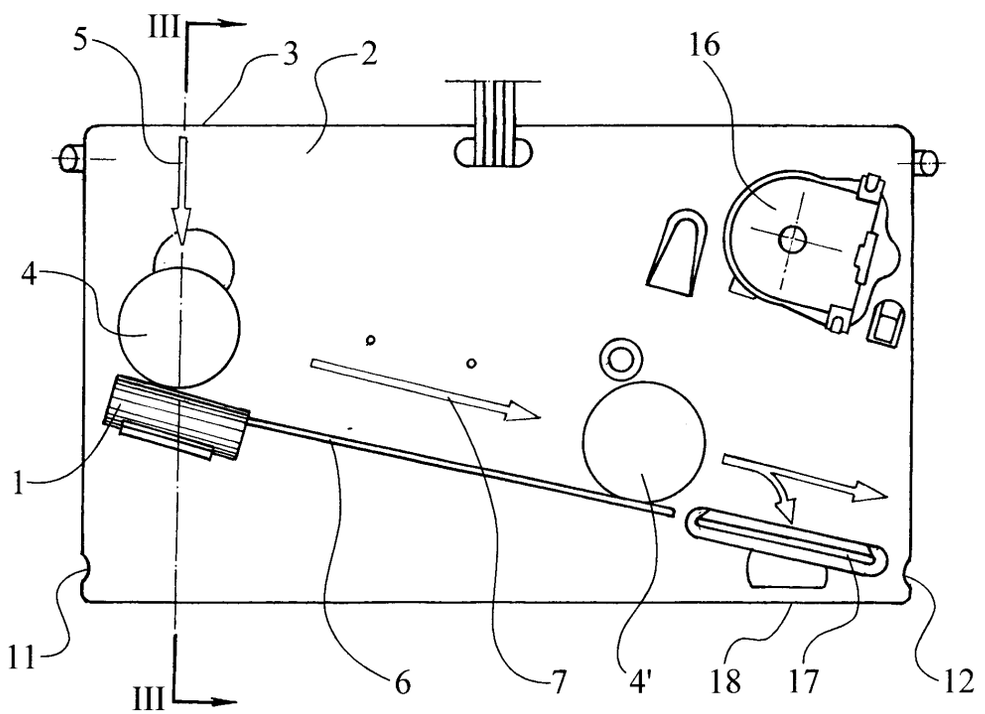

FIG. 1

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Description

DESCRIPTION

[0001] The present invention is intended to provide a device for controlling the speed of passage of discoidal elements along a guide channel.

[0002] In particular, the present invention can be used to control the speed of passage of coins in an apparatus for identifying and checking the validity of coins, which is applicable especially to automatic vending machines.

[0003] In currently known machines, it is necessary for the speed of passage of the coins or other discoidal elements used to operate the machines, such as tokens or the like, to vary within a determined range, which is not excessively wide, in order to permit correct operation of the remainder of the means making up the apparatus for identification and checking validity.

[0004] The present invention is intended precisely to ensure that the speed of passage of the discoidal elements, which may be coins, tokens or the like, is regularised within determined limits in order to achieve the above-mentioned aims.

[0005] Apparatus currently known on the market use anvil-type members which receive the discoidal elements as they enter the apparatus and which have a device for the collision thereof, it also being possible to use grooves. However, the variation in the actual region of contact between the discoidal element and the anvil or the receiving surface of said member may cause substantial deviations in the speed of passage which it is desired to regulate.

[0006] In addition, an important aim of the present invention is to provide a mechanical device which is inexpensive and requires a low level of investment and which permits control of the speed of the discs which are subsequently guided by a ramp, irrespective of the speed of introduction via the inlet slot.

[0007] The present invention is based on arranging a control member inside the identifying apparatus, on the path followed by the discoidal elements, in such a manner that, when the discs hit the control member, some of their kinetic energy is absorbed, so that the remaining energy, which has not been absorbed, causes the disc to roll along the inclined guide ramp on which the various identification parameters are measured with sufficient time for the coordinated operation of the various devices and, if necessary, of the mobile ramp arranged at the end of the rolling path.

[0008] The present invention is based on bringing about the collision of the disc with the control member on the smallest surface possible, practically in point form, thus achieving very high pressures which brings about the deformation of one of the elements absorbing the necessary kinetic energy.

[0009] The control member preferably has a cylindrical form so that, on collision with the discoidal piece, the periphery of which is likewise cylindrical and which is oriented perpendicularly relative to the control member, an impact region is obtained which is constituted by the point of intersection of the generatrices of the cylinders.

[0010] For optimum functioning of the device, the control member should have a greater hardness than the discs, preferably selecting stainless steel, which is also non-magnetic, which imposes a neutral behaviour towards any magnetic fields generated in the identifying device.

[0011] The control member is mounted on a support plate in such a manner that the plane of the region of entry of the discs intersects the longitudinal axis of the control member in a collision region which is offset towards one of its sides, which causes the disc, in addition to rolling along, while rotating about the axis of symmetry of the cylinder constituting it, to slide with one of its faces adjacent to the wall of the rolling region, which at the same time has the inclination imparted to it by the assembly of the identifying device as a whole, which is inclined towards its rear portion.

[0012] Thus, the disc rolls along, sliding on the support plane so that the conditions for the identification of the discoidal piece are more constant without depending on the initial speed or on the mechanical characteristics of the disc in terms of diameter or thickness.

[0013] To aid understanding, some explanatory drawings of a preferred embodiment of the present invention are added by way of non-limiting explanatory example.

[0014] Figure 1 is a front elevation view of one of the two halves of the device forming the subject-matter of the present invention.

[0015] Figure 2 is an elevation of the other integral member or the second half of the device.

[0016] Figure 3 shows schematically a section through the unit.

[0017] As shown in the Figures, the device forming the subject-matter of the present invention basically comprises a device for controlling speed which is formed by a cylindrical member 1 connected to a carrying plate 2 and facing a region 3 for the entry of the coins or discoidal pieces 4 which, from the inlet, follow a vertical direction of displacement represented by the arrow 5.

[0018] The cylindrical member 1 is preferably formed from stainless steel or other material having a hardness greater than that of the discoidal pieces 4, which may be coins or tokens or the like. The member 1 is substantially flush with a guide 6 formed, for example, by a rib which projects from the plate 2 and which is used to determine the path of displacement of the discoidal pieces which is represented by the arrow 7, a discoidal piece 4' also having been represented in a more advanced position on the guide ramp.

[0019] The intersection between the cylindrical surface of the discoidal piece 4 and the cylinder 1 means that contact is practically in point form, thus regularising the impact surface and causing the pressure to be high, because the contact surface is very small, thus permit-

ting the absorption of a very large portion of the kinetic falling energy of the discoidal element 4.

[0020] In order to improve the guiding of the discoidal piece 4 along its path, the device comprises a second plate 8, Figure 2, which faces the plate 2 and is joined thereto by any conventional means, for example, by means of small internal projections 9 and 10 of the plate 8 which are guided by the recesses 11 and 12 in order to permit the retention thereof in the opposite edge of the plate 2. The plate 8 has a rib 13 which determines, together with the inclined rib 6 of the plate 2, the path for the discoidal elements 4 indicated above. At the same time, it has several ribs parallel to those of the lower guide 6 and 13, and of a much smaller thickness, which have been represented with the numerals 14 and 15 and which are to provide side support regions for the discoidal pieces during their displacement along the guide path.

[0021] In order to improve the guiding of the discoidal pieces 4 along their path, the speed control member 1 is incorporated in the plate 2 with a given displacement, that is to say, the axis of symmetry of the cylindrical member 1 does not coincide with the face of the plate 2, projecting slightly therefrom, with the result that the discoidal piece 4 has a tendency to sit against the face of the plate 2, so that the discoidal piece rolls along the lower guide formed by the ribs 6 and 13 and along the face of the plate 2, obtaining rolling conditions of great uniformity.

[0022] Incorporated in the plates 2 and 8 are other elements of the unit for identifying coins, such as the motor 16, the movable ramp 17 in the case of rejected discoidal pieces which fall via the region 18 of the device towards the outside, and also the control photodiodes 19 and 20 and the inlet photodiode 21, which are incorporated in the plate 8.

[0023] As will be appreciated, the device forming the subject-matter of the present invention has features of great simplicity and functional efficiency, so that it permits, at the same time, better behaviour of the device in its task of regularising the speed of passage of the discoidal elements to be controlled and, in addition, it requires only elements of great simplicity which bring an undoubted cost advantage.

Claims

1. Device for controlling the speed of passage of discoidal elements, characterised in that it comprises a cylindrical member arranged with a given inclination relative to the horizontal, facing the inlet for the discoidal elements, bringing about point-form contact between the control member and the discoidal piece for the purposes of regularising the reduction of the kinetic energy of an incoming discoidal piece, and also the spped of displacement along the path for the discoidal pieces, which path is determined by an inclined guide arranged as a continuation of the cylindrical control member.

2. Device for controlling the speed of passage of discoidal elements, according to claim 1, characterised in that the cylindrical member controlling the speed is formed from a material of greater hardness than that of the discoidal pieces to be controlled.

3. Device for controlling the speed of passage of discoidal elements according to the preceding claims, characterised in that the cylindrical member controlling the speed is formed from stainless steel.

4. Device for controlling the speed of passage of discoidal elements according to claim 1, characterised in that the cylindrical control member is connected to a support plate with its axis of symmetry projecting slightly relative to the face on which the guide path for the discoidal elements is located, in order to promote the displacement of the discoidal elements sitting against the opposite face of the support plate, thus regularising their displacement.

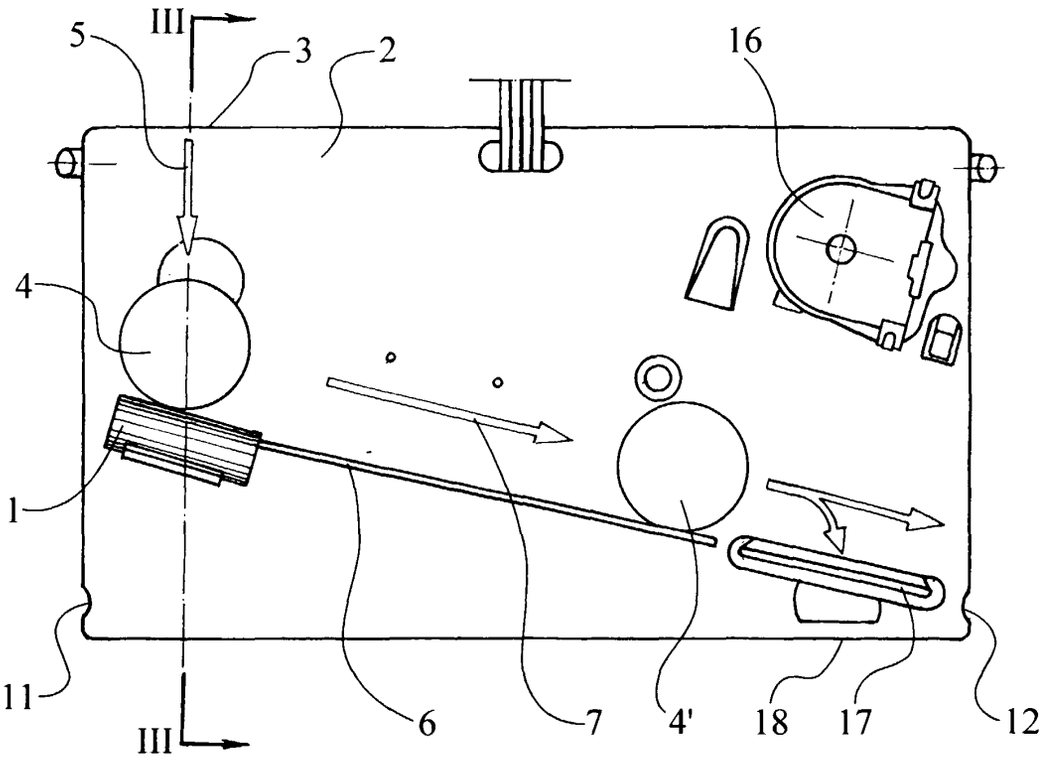

FIG. 1

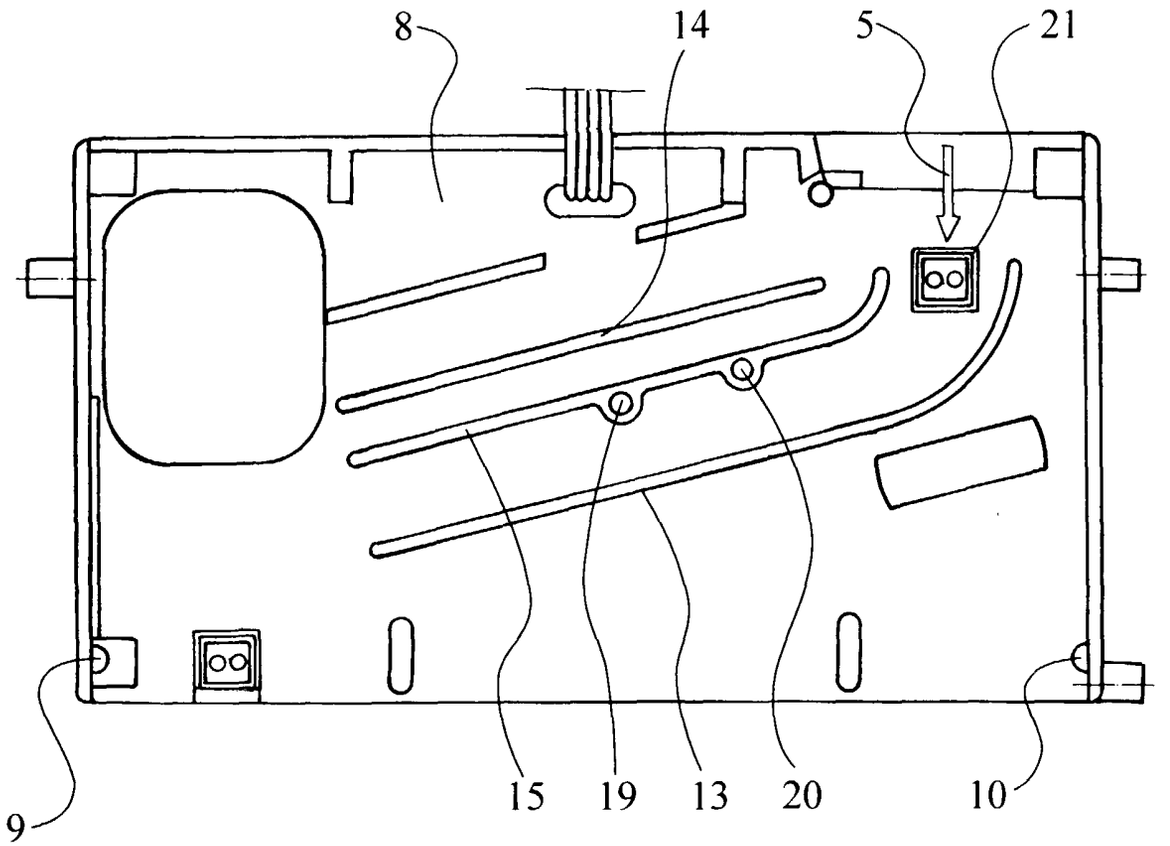

FIG. 2

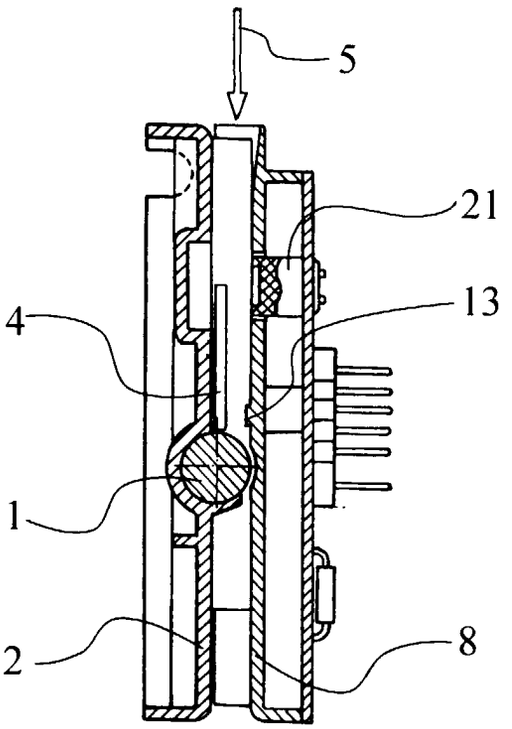

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 00 50 0049

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 July 2000	Teutloff, H

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