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71 Applicant: **AGES S.p.A. Azienda Generale Elettronica Servomeccanismi, Via per Castelletto, F-28040 Borgoticino (Province of Novara) (IT)**  
Applicant: **TESALON S.A., Via Volta, 16, Chiasso (CH)**

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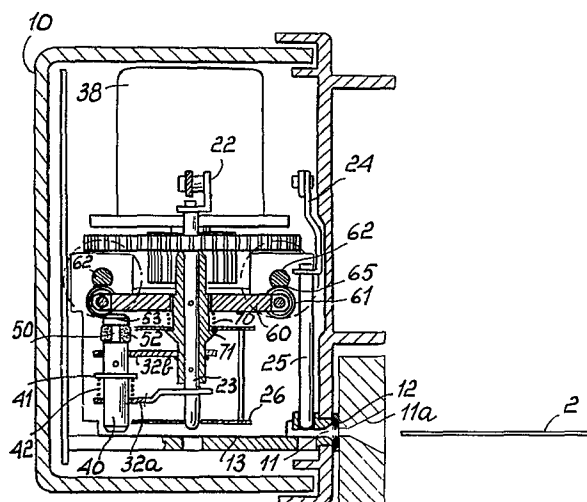
72 Inventor: **Gassino, Teresio, Via monte Navale, 8/F, 10015 Ivrea (Province of Torino) (IT)**  
Inventor: **Colombo, Gianni, Via Lazzaretto, 28040 Borgoticino (Province of Novara) (IT)**

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74 Representative: **Modiano, Guido et al, MODIANO & ASSOCIATI S.A.S. Via Meravigli, 16, I-20123 Milan (IT)**

54 **Badge card or vend ticket marking machine, and badge card or vend ticket to be used therewith.**

57 A badge card obliterating machine and a badge card therefor are described, the obliterating machine comprising a detector (20) located at a detent surface (13) whereon the card (1) is caused to rest, a reading head (30) for reading the card (1) and actuated by a first motor (38), and an obliterating sleeve punch assembly (40, 50) effective to destroy the first mark in a mark set corresponding to the service utilized and actuated by a second motor (64) controlled by the reading head (30). The badge card comprises a plate-like element (1) of rectangular configuration with three rounded corners and a sharper fourth corner (2) effective to act as a locating element for the card and to cooperate with the detector (20).



TITLE .  
see front page

This invention relates to a badge card or vend ticket marking machine, and to a badge card or vend ticket to be used therewith.

As is known, increasingly more services and facilities utilize a badge card or vend ticket system. Badge card, or vend ticket, defines a document which is sold or otherwise granted to the user/authorizing the latter to avail him/herself reiteratively of a certain service, or of a given type of facility, each utilization or consumption involving the expenditure of a certain number of marks from the card or ticket.

Basic requisites of a badge card or vend ticket are that it must be identifiable by automatic machines enabled to mark, or obliterate, a given number of marks corresponding to the service sought, capable of being checked visually even by the user him/herself for the marks expended, and be wear and tear resisting.

Cards or tickets of that general type have been in use for some time and comprise in general a piece of cardboard or the like material, provided, for instance, with suitable blocks or spaces, practically corresponding to as many marks of the card, which are then punched or otherwise invalidated each time that the user utilizes the intended service or facility.

That approach, albeit a practical one, has the serious drawback of being easily deceived, and that it cannot be easily and reliably identified by



the marking machine.

In an attempt at eliminating the above problem, badge cards or vend tickets have been introduced which incorporate a magnetic zone, wherein a code or  
5 identifying information can be easily included, the magnetic zone also including the expendible marks. The latter form, while much better safeguarded against counterfeiting and a deceitful use of the card, has  
10 the serious fault that it is mechanically "delicate", in that any folds or small local damage can result in the marking machines being unable to identify it. Moreover, since the information and marks are provided in the magnetic zone, incidental or intentional  
15 cancellation of the information and marks becomes a possibility where the card or ticket is placed close to a permanent magnet or other source of a magnetic field.

Further known solutions also fail to be entirely satisfactory, both as regards their checking by the  
20 automatic marking machines and their ability to be readily identifiable and carry a plurality of items of information as may be required for future computations.

This invention sets out to eliminate the draw-  
25 backs mentioned hereinabove by providing a badge card or vend ticket which is easily and unmistakably indetifiable by automatic marking machines, and which can be readily utilized even in the presence of local deterioration and cannot be practically  
30 counterfeited.



The invention is further directed to providing a marking machine for use with the above card or ticket, which is enabled to mark, or obliterate, the marks corresponding to a given service such that the user can easily check the number of marks used up, and accordingly of the marks still left available.

Within the above general aims, it is further possible to arrange that the badge card or vend ticket according to the invention is exceptionally impervious to the action of water, snow, low temperature and mishandling by its user, still retaining its integrity or usability.

It is further possible to arrange that the badge card or vend ticket according to this invention, while being of quite a compact size, can contain a high number of information items in addition to a conveniently high number of usable marks.

It is further possible to arrange that the marking or obliterating machine according to the invention is extremely reliable in operation, to ensure troublefree and consistent performance.

It is further possible to arrange that both the marking or obliterating machine, as well as the badge card or vend ticket, according to this invention, can be easily formed from readily available components, and are relatively inexpensive to manufacture, such as to be competitive with conventional apparatus.

According to one aspect of the present invention, there is provided a marking or obliterating machine for badge cards or vend tickets, characterized in that



it comprises card positioning and locking means actuated by the introduction of said card, means for reading said card and actuated by a first motor, and marking or obliterating means effective to destroy  
5 the first mark in the set of marks corresponding to the service utilized and actuated by a second motor controlled by said card or ticket reading means.

Further features and advantages will be more clearly apparent from the description of a preferred,  
10 but not limitative, embodiment of a badge card or vend ticket marking machine, as well as of the badge card or vend ticket to be used therewith, as illustrated by way of example only in the accompanying drawings, where:

15 Figure 1 shows schematically a badge card or vend ticket according to the invention;

Figure 2 shows, to an enlarged scale, a detail of the groove formed in the badge card or vend ticket;

Figure 3 shows schematically the cyclic sequence  
20 representing the card or ticket marks;

Figure 4 is a schematical plan view, partly in section, of the present marking machine;

Figure 5 is a sectional view taken along the line V-V of Figure 4;

25 Figure 6 is a sectional view taken along the line VI-VI of Figure 4; and

Figure 7 illustrates, to an enlarged scale, the badge or ticket reading means.

With reference to the cited drawing figures, the  
30 badge card or vend ticket according to this invention



comprises a plate-like element 1 having, of preference, a rectangular shape with three rounded corners and a fourth corner, indicated at 2, which stands out more such as to function as a locating element for

5 accurately positioning the badge card or vend ticket.

The plate-like element 1 which makes up the badge card is preferably formed from a plastics material, e.g. of the same type as that normally used in record manufacturing; moreover, the plate-like  
10 element 1 has a much reduced thickness, for example of approximately 0.2 mm.

Along the longitudinal centerline of the plate-like element 1, there is provided a first through hole 3 and a second through hole 4, which holes, as  
15 will be apparent hereinafter, have the function of permitting the card 1 to be positioned and locked; also provided is a third through hole 5 at an edge, the function whereof is simply that of allowing the card or ticket 1 to be tied to a string or similar  
20 element.

Concentrically with the first hole 3, there is provided a circular groove 6 comprising at least a first zone, schematically indicated at 6a, wherein the card identification data are provided as well as  
25 any other useful item of information, and a second zone, indicated at 6b, wherein symbols are provided which are representative of the marks proper.

More specifically, and as shown in Figures 2 and 3, a start up point is provided, as indicated at 7,  
30 which represents the starting point in reading the



card, alongside which there extends the zone 6a which carries card identification information, the marks being encoded in cyclic sequences, as shown in detail in Figure 3; by way of example only, it is possible to arrange in the cited groove forty identification bits and two hundred mark bits grouped as two per mark, i.e. in practice to produce a card or ticket with a one hundred mark capacity.

The badge card or vend ticket has the important advantage that it cannot be counterfeited because, as mentioned, the marks are represented thereon in cyclic sequences, namely the groove exhibits a given pattern for each mark which corresponds to a logic code identifiable by the machine, and because, as mentioned, the plate-like element 1 is formed from a plastics material and cannot be easily altered or damaged, local damage being insufficient to result in void reading of the card or ticket, by virtue of the marks being arranged in a cyclic sequence, thereby they can be read by the marking or obliterating machine even if the card happens to be damaged locally.

With reference to Figures 4 to 7, there is shown the marking or obliterating machine for accepting the type of badge card or vend ticket just described.

The marking or obliterating machine comprises an outer frame, generally indicated at 10, which is formed with a slot 11 for the introduction of the card or ticket 1 therein, said slot being preferably provided with a lead-in mouth 11a downstream whereof

a pair of brushes 12 are provided which have the function of removing dust and impurities which may deposit on the card 1.

At the slot 11, a detent surface is provided, as indicated at 13, on which the card or ticket 1 is caused to rest after being introduced into the marking or obliterating machine.

The marking or obliterating machine further comprises means for positioning and locking the card or ticket 1, which are actuated directly by the introduction of the card or ticket into the machine. Said locating means comprise a detector 20 arranged on the detent surface 13 and being adapted to be actuated by the cited corner 2 of the card 1 which is an indication that the card 1 has been correctly inserted.

The cited detector 20 controls a bistable solenoid 21 which drives a rocker-arm element 22 carrying at its free end a first locating pin 23 intended for penetrating said first hole 3 in the card 1. Moreover, to said rocker-arm element 22, there is connected an arm 24 which carries a second locating pin 25 adapted for insertion through the second hole 4. Said first pin 23 passes, with its lower free end, through a small disk 26 which serves as a detent element with respect to the surface 13.

The disk 26 has a diameter equal to the transversal dimension of the card or ticket, and serves the function of allowing a pre-determined space for the card. For constructional reasons, the disk will



rotate along with the first pin 23.

The marking or obliterating machine further comprises means for reading the card or ticket 1, which comprise a head 30 having a needle 31 engage-  
5 able in the groove 6, the needle being supported, in a manner which will be explained hereinafter, in lower brackets 32a and upper brackets 32b which are cantilever-connected to the pin 23 and project outwardly in a radial direction.

10 More specifically, the head 30 is carried by a block 33, which is hinged at 34 to the lower bracket 32a and has at the top a sloping lug 35 adapted for engagement through a slot 36 formed in the upper bracket 32b; the sloping lug 35, in engaging the  
15 bracket 32b, acts as a speed limiter during the final stage of the downward movement and limits the extent to which the block 33 can oscillate, the block being in turn connected through a coil spring 37 to the lower bracket 32a, thereby an elastic pressure is  
20 applied at all times which keeps the needle 31 in close contact with the groove 6.

When the card is not inserted, and the first pin 23 is accordingly in its raised position, the needle is prevented from dropping downwards since the  
25 rotation of the block 33 is hindered by the lug 35 engaging in the slot 36.

Also provided is a first stepping motor 38, whereto a pinion gear 39a is keyed which meshes with a gear wheel 39b keyed to the pin 23 which has the  
30 function of rotating the pin 23 and consequently the

head 30 to effect the reading. It should be noted that the pinion gear 39a has a greater axial height than the gear wheel 39b, such as to remain in mesh engagement regardless of the displacement of the pin  
5 23.

The marking or obliterating machine also includes obliterating means which are operative to destroy a pertinent mark in the groove 6, and more precisely, as will be explained hereinafter, the first  
10 mark in the set of marks corresponding to the service utilized.

Such obliterating means comprise a pusher sleeve 40 which is carried by said brackets 32a and 32b for sliding movement along a direction substantially  
15 parallel to the axis of the pin 23; moreover, on the outer surface of the pusher sleeve 40, there is provided a small ring 41, whereon a lift spring 42 is active which acts with its other end against the lower bracket 32a and has the function of keeping  
20 the pusher sleeve 40 slightly raised off the card 1 in the non-obliterating condition.

Inside the pusher sleeve 40, a punch 50 is provided for sliding movement therein, which has its lower end at a lower edge 51 on the pusher sleeve 40  
25 serving the function of abutting against the card 1 during the obliteration to prevent the "upsetting" of the card, that is the stretching of the plastic material during the obliteration step, as explained hereinafter.

30 Said punch 50 is driven out of the top of the

pusher sleeve 40, an elastic pad 52 being interposed, which is adjusted to have a high force value, between the top end of the sleeve 40 and the head 53 of the punch 50.

5           The head 53 of the punch 50 urges in contact relationship a pusher table 60 the downward stroke whereof, to apply a pressure action on the punch 50, is accomplished through ball bearings 61 carried rotatively by the pusher table 60, which engage with  
10 shafts 62 rotatively supported in the frame 10 and driven rotatively by drives, generally indicated at 63, powered by a DC motor 64. At the engagement area between the shafts 62 and bearings 61, notches 65 are provided in scroll-like configuration which are  
15 formed on the shaft 62 such that at that contact point the shaft is practically in the form of a camming element, thereby when the bearings 61 are located inside the notches, the table 60 is in a raised position, whereas when they engage with the remaining  
20 portion of the shaft, the table is urged downwardly.

Furthermore, a return spring 70 is provided which acts on the lower or bottom face of the table 60, a detent 71 being arranged on an embossment rigid with the pin 23.

25           The downward stroke of the table 60, which occurs upon the motor 64 receives the consent to obliteration from the reading means, produces a pressure or pushing action on the head 53, and as a first result the punch 50 is caused to move downwards together with the  
30 pusher sleeve 40 against the elastic resistance of

the spring 42; as the table 60 continues to move downwards, the elastic resistance of the pad 52 is overcome, thereby a sliding movement occurs between the punch 50 and pusher sleeve 40, which is pressed  
5 onto the card 1 to prevent it from being upset, whilst the punch 50 moves out to destroy the mark, an operation which consists in practice in forming a crosswise groove 7a on the groove 6, thus  
10 a readable mark, as gainst a generical obliteration of the groove 6.

The operation of the marking or obliterating machine according to the invention is the following. Upon insertion of a badge card or vend ticket 1, the  
15 bistable solenoid 21 is initially activated through the sensor 20, which causes the first and second pins 23 and 24 to be lowered and hold the card 1 in position.

In the event that the card 1 fails to be  
20 correctly positioned, the pins 23 and 25 are not lowered and the machine operation is interrupted.

After the pins 23 and 25 have been lowered, thereby the card 1 is correctly positioned, the reading means are activated, the reading means being  
25 pre-arranged such that the reading always starts from the foremost point, so that the zone 6a is read first which contains the items of information, thereafter the zone 6b is read continuously until the needle 31 reaches an already obliterated mark; upon reaching  
30 an already obliterated mark, the equipment

of the reading head 30 is rotated through as many positions as are the marks which must be invalidated for the specific service utilized, as well as through the distance separating the needle 31 from the punch 50. In other words, the reading is practically effected in a forward direction from the identification, whereas the cancellation is effected in a rearward direction.

After the rotary equipment has brought the punch to the mark to be obliterated, which mark will correspond in practice to the first mark in the set of marks required for a particular service to be utilized, the motor 64 is energized.

The energization of the motor 64 causes, as mentioned already, the table 60 to be lowered, with accompanying downward movement, first of the pusher sleeve 40, and subsequently of the punch 50, which by squeezing the card 1, produces a deviation of the groove, thus practically invalidating the mark.

Thus, it will be appreciated that, since the reading head continues its reading action until it reaches an obliterated mark, that is an area of the groove 6 whereat a squeezing action has been applied, it will be sufficient to invalidate a single mark corresponding to the set of marks required by that given service, because the reading is not carried on beyond one obliteration.

It will be apparent from the foregoing that the invention achieves its objects, and particularly the fact is emphasized that the badge card 1 just

- described is extremely convenient to use, it being formed from a plastics material having excellent mechanical strength properties, and since the groove which corresponds to the system information as well
- 5 as to the marks is engraved, it is not possible to incidentally cancel it, as is the case with magnetic cards, and on account of the marks and information being encoded in a cyclic sequence, the groove cannot be altered deceitfully.
- 10 It should be added to the foregoing that the obliterated region, i.e. the squeezed mark, is readily visible to the user, who is thus enabled to check at any time exactly how many marks he/she has left on the card.
- 15 Moreover, it will be possible to imprint the card or ticket with as many items of information as are required, because the latter do not interfere in any way with the automatic card reading means.
- 20 The invention as described is susceptible to many variations and modifications, within the purview of the instant inventive concept.
- Furthermore, all of the details may be replaced with other technically equivalent elements.
- 25 In practicing the invention, the materials employed, as well as the shapes and dimensions, may be any ones to suit contingent requirements.

CLAIMS

1           1. A marking or obliterating machine for badge  
2 cards or vend tickets, characterized in that it  
3 comprises card positioning and locking means actuated  
4 by the introduction of said card (1), means (30) for  
5 reading said card (1) and actuated by a first motor  
6 (38), and marking or obliterating means (40,50) effec-  
7 tive to destroy the first mark in the set of marks  
8 corresponding to the service utilized and actuated  
9 by a second motor (64) controlled by said card or  
10 ticket (1) reading means.

1           2. A marking or obliterating machine according to  
2 Claim 1, characterized in that said card positioning  
3 and locking means comprise a detector (20) located  
4 at a detent surface (13) whereon said card (1) is  
5 caused to rest, said detector (20) driving a solenoid  
6 (21) in turn acting, through a rocker-arm element (22)  
7 and an arm (24) onto a first pin (23) and second pin  
8 (25) adapted for insertion into a first hole (3) and  
9 second hole (4) in said card (1).

1           3. A marking or obliterating machine according  
2 to one or more of the preceding claims, characterized  
3 in that it comprises a slot (11) provided with a  
4 lead-in mouth (11a) and located at said detent  
5 surface (13) for the introduction of said card (1)  
6 therein, at said slot (11) there being provided  
7 brushes (12) operative to clean the surfaces of said  
8 card (1).

1           4. A marking or obliterating machine according  
2 to one or more of the preceding claims, characterized



3 in that said card reading means comprise a head (30)  
4 having a needle (31) engageable in a groove (6)  
5 formed on said card (1), said head (30) being  
6 carried by a block (33) hinged to a lower bracket  
7 (32a) rigidly associated with said first pin (23)  
8 and being provided at the top with a sloping lug (35)  
9 adapted for insertion in a slot (36) formed in an  
10 upper bracket (32b), also rigid with said pin (23),  
11 and adapted for engaging in contact relationship  
12 with said upper bracket 32b to serve as a downward  
13 movement speed limiter, said slot (36) in cooperation  
14 with said lug (35) being effective to limit the  
15 oscillation of said block (33), said block (33) being  
16 connected to said lower bracket (32a) through a  
17 coil tension spring (37).

1 5. A marking or obliterating machine according to  
2 one or more of the preceding claims, characterized in  
3 that it comprises a first stepping motor (38) to the  
4 shaft whereof a pinion gear (39a) is keyed which  
5 meshes with a gear wheel (39b) keyed to said first  
6 pin (23) and adapted to rotate said pin (23), said  
7 pinion gear (39a) having a greater axial height than  
8 said gear wheel (39b) to maintain said gear wheel  
9 (39b) and said pinion gear (39a) in mesh engagement  
10 independently of the displacement of said first pin  
11 (23).

1 6. A marking or obliterating machine according  
2 to one or more of the preceding claims, characterized  
3 in that said obliterating means comprise a pusher  
4 sleeve (40) carried by said lower (32a) and upper





5 (32b) brackets for sliding movement along a direction  
6 substantially parallel to the axis of said first pin  
7 (23), on the outer surface of said pusher sleeve  
8 (40) there being provided a small ring (4) whereon  
9 a lift spring (42) is active having its other end  
10 active on said lower bracket (32a) and being adapted  
11 to hold said pusher sleeve (40) raised.

1 7. A marking or obliterating machine according  
2 to one or more of the preceding claims, characterized  
3 in that it comprises, within said pusher sleeve (40),  
4 a punch (50) arranged to move axially in said pusher  
5 sleeve (40) and having its lower end located at a  
6 lower edge (51) of said pusher sleeve (40), said  
7 punch (50) protruding out of the top of said pusher  
8 sleeve (40) and there intervening an elastic pad (52)  
9 between the top end of said pusher sleeve (40) and  
10 the head of said punch (50), the head (53) of said  
11 punch (50) acting in contact relationship on a  
12 pusher table (60) whereon are active means for  
13 displacing said pusher table (60).

1 8. A marking or obliterating machine according to  
2 one or more of the preceding claims, characterized  
3 in that said means for displacing said pusher table  
4 (60) comprise ball bearings (61) rotatively supported  
5 by said pusher table (60) and engaging with shafts  
6 (62) supported in the frame (10) of said marking or  
7 obliterating machine and rotated by a second DC motor  
8 (64), at the engagement area between said shafts (62)  
9 and said bearings (61) there being provided scroll-  
10 like notches (65) forming on said shafts (62) camming

11 elements in engagement with said bearings (61), to  
12 produce a shorter rotation than 360°.

1 9. A marking or obliterating machine according  
2 to one or more of the preceding claims, characterized  
3 in that it comprises a return spring (70) acting on  
4 the lower face of said table (60) and a detent (71)  
5 provided on an embossment rigid with said first pin.

1 10. A badge card or vend ticket for use with  
2 the marking or obliterating machine of the preceding  
3 claims, characterized in that it comprises a  
4 plate-like element (1) of rectangular configuration  
5 with three rounded corners and a sharper fourth  
6 corner (2) effective to act as a positioning or  
7 locating element for said card (1), said fourth  
8 corner being adapted to interact with said detector  
9 (20).

1 11. A badge card or vend ticket according to  
2 Claim 10, characterized in that said plate-like  
3 element (1) is formed from a plastics material and  
4 has on its longitudinal centerline a first through  
5 hole (3) adapted for engagement with said first pin  
6 (23) and a second through hole (4) adapted for  
7 engagement with said second pin (25).

1 12. A badge card or vend ticket according to one  
2 or more of the preceding claims, characterized in that  
3 it comprises a third through hole (5) at one edge of  
4 said plate-like element.

1 13. A badge card or vend ticket according to  
2 one or more of the preceding claims, characterized  
3 in that it comprises, concentrically with said first

4 hole (3), a groove (6) of substantially circular  
5 configuration including at least a first zone (6a)  
6 containing card identification data, and at least a  
7 second zone (6b) containing symbols corresponding  
8 to the card marks.

1 14. A badge card or vend ticket according to  
2 one or more of the preceding claims, characterized  
3 in that said data and said symbols are in the form  
4 of encoded symbols having a predetermined sequence.



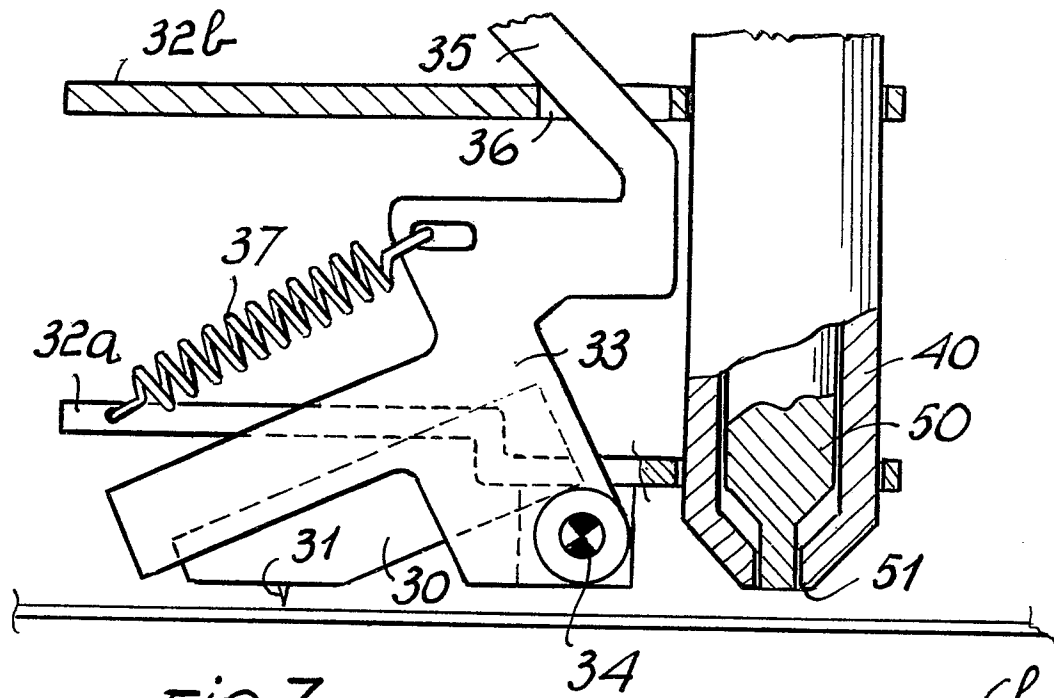


Fig. 7

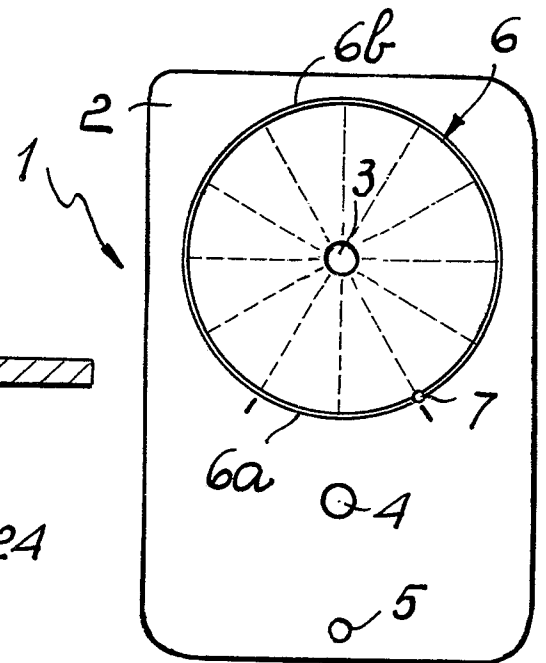


Fig. 1

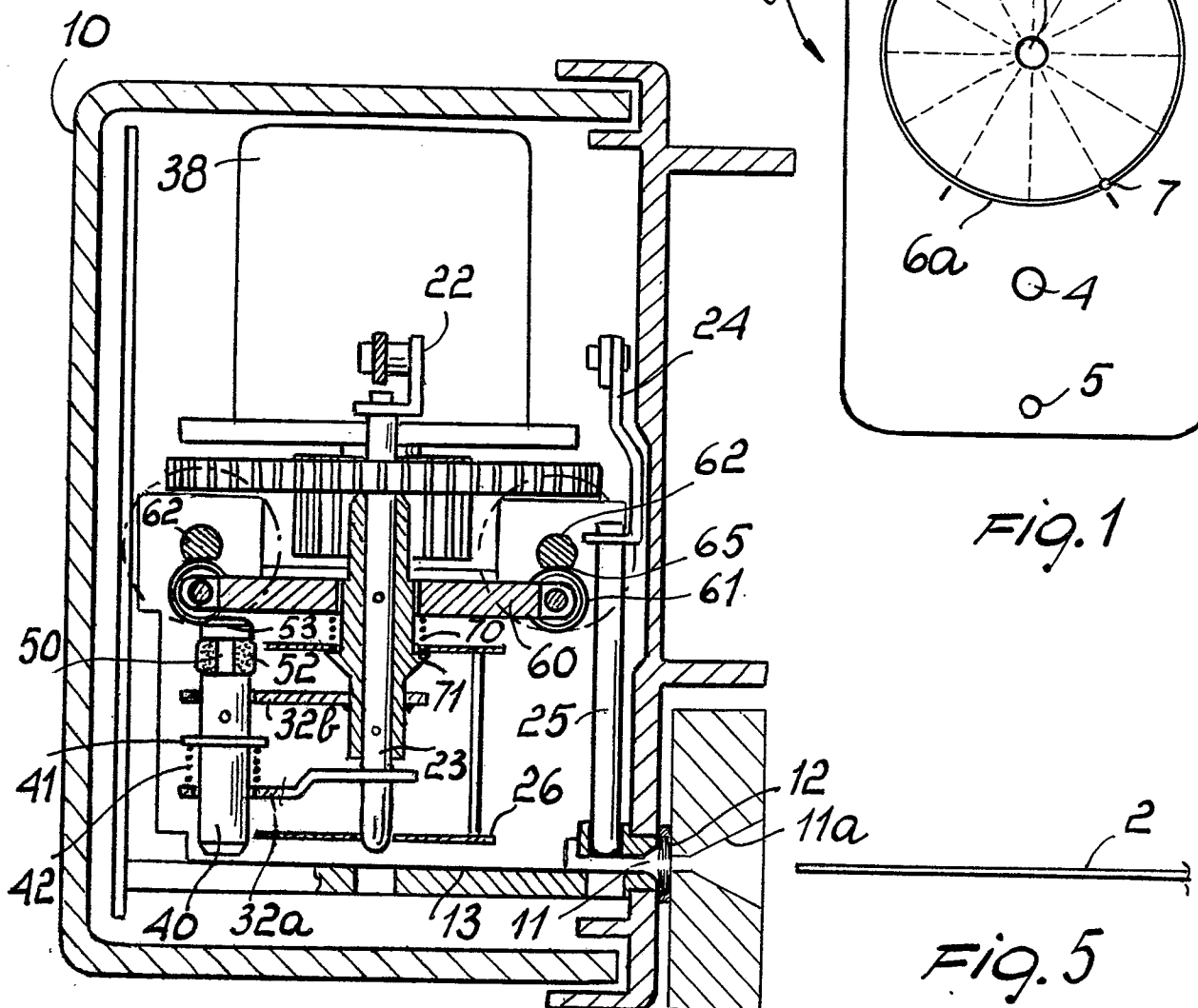
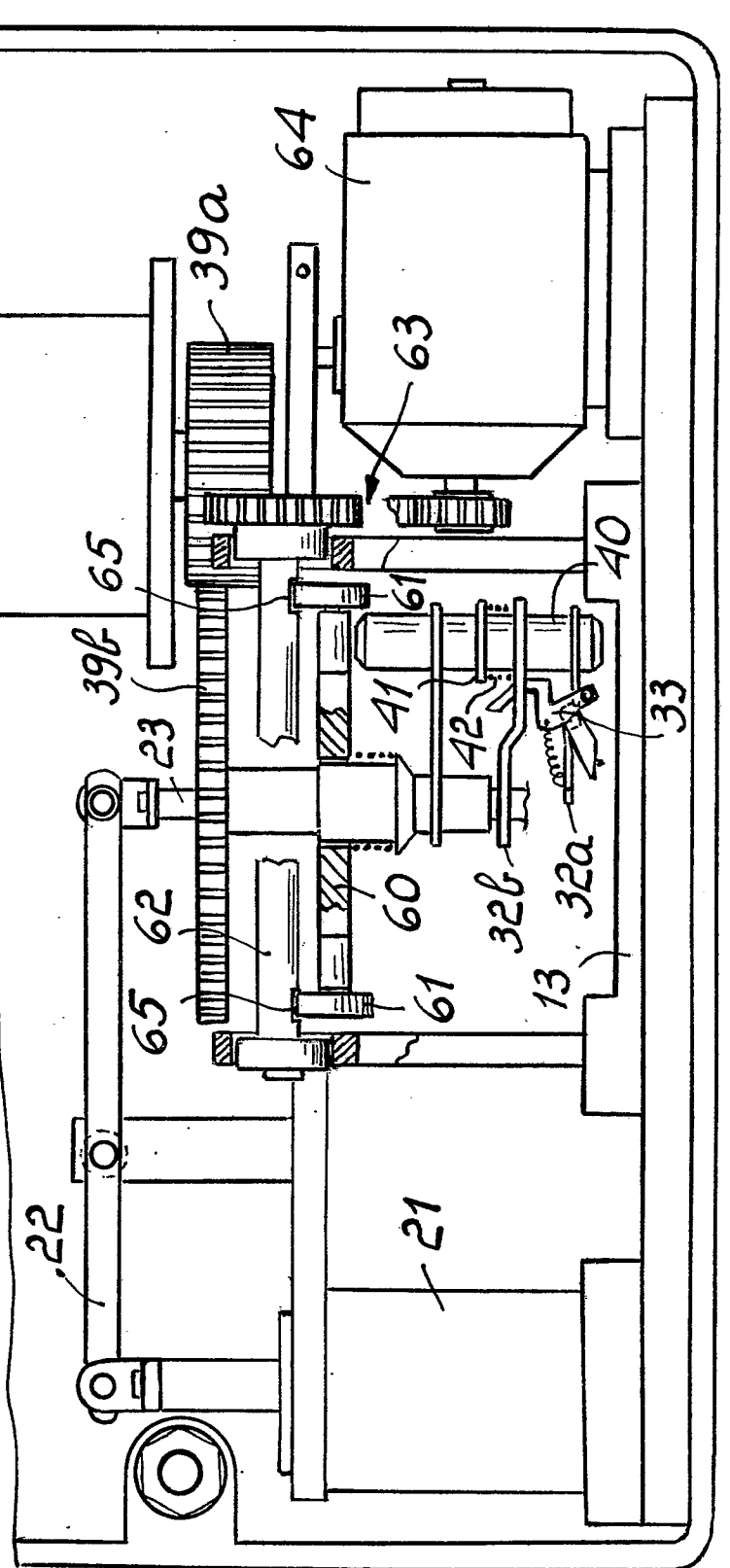
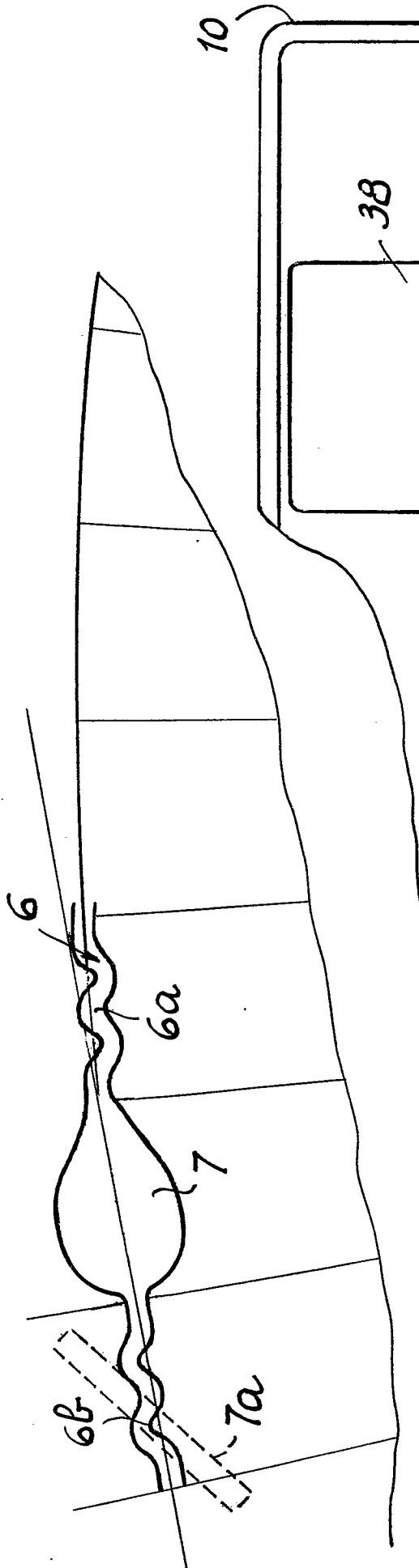


Fig. 5



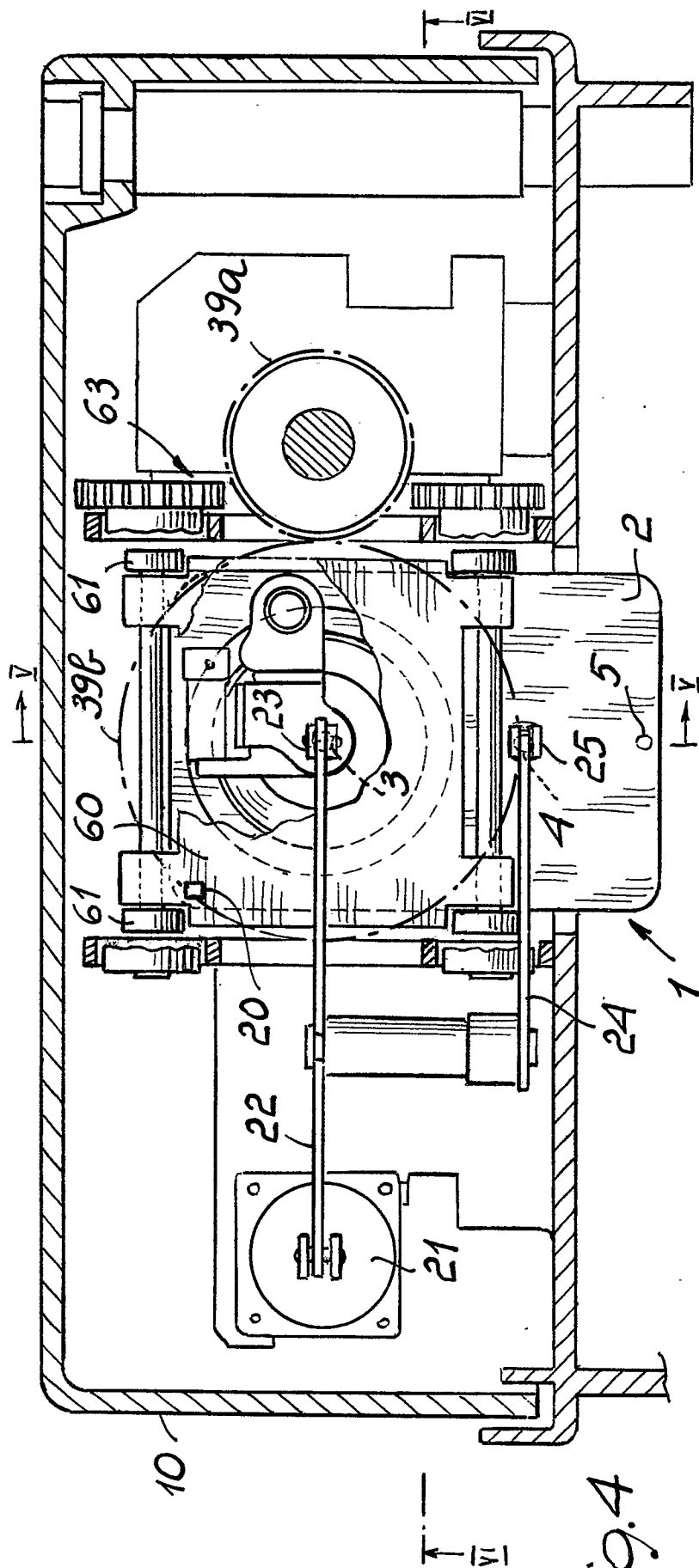


Fig. 4

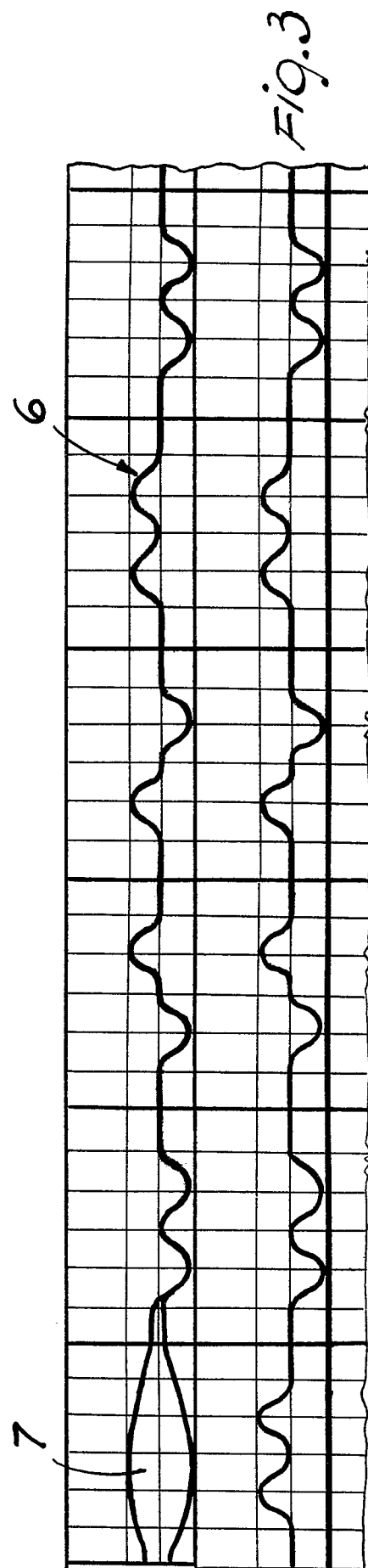


Fig. 3



European Patent  
Office

# EUROPEAN SEARCH REPORT

0021201

Application number

EP 80 10 3169

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
P	<u>US - A - 3 097 347</u> (L.G. SIMJIAN) * Column 6, lines 6-72; figures *	1,3,4, 10,13, 14	G 07 B 11/11
	--		
	<u>US - A - 3 530 968</u> (A.W. PALMER) * Abstract; figures; column 3, line 46 - column 6, line 61 *	1,3,6, 7,10, 11,14	
	--		
	<u>FR - A - 2 262 353</u> (SCHEIDT & BACH-MANN) * Claims; figures * & BR - A - 1 460 693	1,3,5, 7,8, 10,13, 14	TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
	--		G 07 F 7/00 7/02 7/08 7/10 17/14
	<u>DE - A - 2 801 041</u> (H. STOCKBURGER) * Claims; figures *	1,3,10	G 07 C 9/00 9/02 11/00
	----		G 07 B 11/00 11/02 11/03 11/05 11/07 11/09 11/11
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	29-09-1980	DAVID	