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(54) **SCORE COUNTER FOR CARDS GAMES**

(57) An automatic counting device (10) for playing cards comprising a body (12) defined by a box-like element internally to which the playing cards to be scored pass through, a compartment or hopper (14) for accommodating the playing cards to be scored organized into a pack (22), a further compartment (16) for receiving and accumulating the scored cards, also organized into a further pack (22'), dragging and moving means for dragging and moving the cards from the compartment or hopper

(14) to the further compartment (16), and means suitable for identifying the values of the cards in order to process their score, a user interface (18), and connection means (20), if any, for connecting to peripherals or storage systems; the device also being characterized in that it comprises a central unit (30) suitable for receiving the data detected by the means suitable for identifying the values of the cards and for processing them.

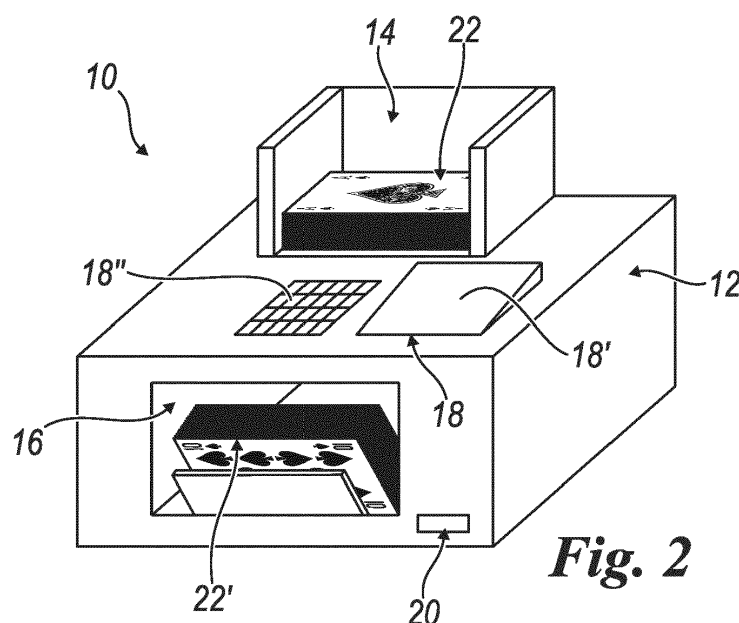


Fig. 2

Description

[0001] The present invention refers to an automatic counting device for playing cards.

[0002] More specifically, the present invention refers to an automatic counting device for playing cards, especially suitable for calculating the score associated with the cards in a specific game.

[0003] It is known that in card games such as, for instance, burako, canasta, or even scala 40 (a kind of rummy), trump, or other games such as bridge and the like, are organized into single or multiple rounds (also referred to as "hands") and entail a calculation of the score reached at the end of the round in order to declare the winner of each individual round (or the winners, in the case of couple rounds).

[0004] Typically, the calculation of the score is made manually and, more specifically, in his/her mind by summing up the values associated with the individual cards as a function of the specific card game and, if necessary, writing down the progressive scores on paper sheets.

[0005] However, such scoring operation might be simple for some games such as, for instance, "scala 40" or trump, whereas it might be more complex in the case of games such as burako, bridge, or the like.

[0006] Therefore, it might happen that the score calculation has to be repeated several times because a card had not been considered or the person who calculated the scores let his/her mind wander or, more trivially, because his/her calculations are not right and, consequently, a new score calculation is necessary.

[0007] All of this represents a drawback in terms of waste of time spent in calculating the scores, a time that is unavoidably subtracted from the true playing time.

[0008] A further drawback consists in that score calculation might lead a player to losing his/her concentration.

[0009] A further drawback is bound to the fact that, in some cases, a loser player is not convinced of the final score and requests a new score calculation and this, besides entailing a waste of time, might even lead to misunderstandings or quarrels between the players.

[0010] An object of the present invention is to obviate the drawbacks mentioned above.

[0011] More specifically, an object of the present invention is to provide an automatic counting device for playing cards.

[0012] A further object of the present invention is to provide an automatic counting device that allows to calculate the score of a card game quickly and accurately.

[0013] A further object of the present invention is to provide an automatic counting device suitable for allowing to score packs of cards of different suits (for instance French, Italian or, further, Spanish suits).

[0014] A further object of the present invention is to provide an automatic counting device suitable for calculating the scores of the cards as a function of the specific type of game in progress.

[0015] A last and further object of the present invention

is to put at the users' disposal an automatic counting device for playing cards suitable for guaranteeing a high durability and reliability over time and also such as to be easily and cost-effectively implemented.

[0016] These objects and others are achieved by the invention that exhibits the characteristics according to claim 1. According to the invention, an automatic counting device for playing cards is provided, which comprises a body defined by a box-like element internally to which the playing cards to be scored pass through, a compartment or hopper for accommodating the playing cards to be scored, organized into a pack, a further compartment for receiving and accumulating the scored cards, also organized into a further pack, dragging and moving means for dragging and moving the cards from the input compartment or hopper to the further card output compartment, and means suitable for identifying the values of the cards in order to process their scores, a user interface, and connection means, if any, for connecting to peripherals or storage systems, the device also being characterized in that it comprises a central unit suitable for receiving the data detected by means suitable for identifying the values of the cards and processing them.

[0017] Advantageous embodiments of the invention are apparent from the dependent claims.

[0018] The constructional and functional characteristics of the automatic counting device for playing cards according to the present invention can be better understood from the following detailed description, in which reference is made to the attached drawings which illustrate a preferred, non-limitative embodiment thereof, and wherein:

figure 1 schematically shows an axonometric view of the automatic counting device for playing cards of the present invention;

figure 2 schematically shows an axonometric view of the automatic counting device for playing cards of the present invention while the cards are being scored; figure 3 shows an explanatory diagram of a circuit of the device according to the invention; figure 4 shows a schematic block diagram concerning a use of the card counting device.

[0019] With reference to the mentioned figures, the automatic counting device for playing cards according to the present invention, identified by the reference numeral 10 as a whole in figures 1 and 2, comprises a body 12 defined by a box-like element, internally to which the playing cards to be scored pass through, a compartment or hopper 14 for accommodating the cards to be scored organized into a pack 22 (figure 2), a further compartment 16 for receiving and accumulating the scored cards, also organized into a further pack 22', a user interface 18, and connection means 20, if any, defined by serial communication interfaces, for connecting to peripherals or storage systems or the like.

[0020] The body 12 houses the dragging and moving

means used to drag and move the cards from the compartment or hopper 14 to the further compartment 16 and means suitable for identifying the values of the cards in order to process their scores.

[0021] The dragging and moving means, not shown in the figures (because known), comprise rollers or belts which pickup one card of the pack 22 at a time (i.e. they perform an operation equivalent to manually "fanning" the cards) and drag it in correspondence with the identification means, also not shown and suitable for identifying the value associated with each individual card.

[0022] The mentioned identification means typically comprise at least one optical detector suitable for reading the images of the cards (for instance an ace, a jack, or the like) and its suit (for instance the Italian, French, Spanish, Japanese, etc. suit) printed on the card and for sending it to a central unit which calculates the value associated with each individual card identified by the optical detector.

[0023] The optical detector is typically defined by an image or optical sensor, for instance of the CCD (Charge Coupled Device) or CMOS (Complementary Metal Oxide Semiconductor) type with, for instance, the use of the ETTR (Expose To The Right) technique, i.e. with a technique that increments the exposure of the image in order to collect as much light as possible and to increment the performances of the optical sensor, and consequently a correct identification of the image. With reference to the preferred embodiment shown in the figures, the user interface 18 comprises, a display screen 18' and a keyboard 18"; the function of the display screen 18' is to enable a user (in this case a player) to display the score associated with the cards processed by the device according to the invention (to this end, said screen includes a user interface), whereas the function of the keyboard 18" is to enable the user to set the scoring parameters (for instance, as a function of the type of game or of the type of cards or suit of cards used) and to move internally to the interface of the display screen itself.

[0024] In accordance with an alternative embodiment, the keyboard 18" might be integral, as a digital keyboard, with the display screen 18' which, for instance, might be a tactile screen or a touch screen.

[0025] The connection interfaces 20, if any, comprise, for instance, an USB (Universal Serial Bus) port or another, known serial communication interface for adding an external storage device or for connecting to peripherals of another type (printer or the like).

[0026] The device according to the invention also comprises a central unit 30 suitable for receiving the data detected by an optical sensor 31, processing it, and sending it to the display screen 18'.

[0027] Said central unit 30 comprises a processor unit 32 and one or several memories 34 (34'), the latter containing the data relevant to the various types of suits of cards and to the various types of card games (in particular, the scoring rules and scores associated with the individual cards are stored therein) and a further memory

36, if any, in which the results of the processing made by the processor unit 32 are saved.

[0028] The processor unit 32 processes the optical readings made by the optical sensor 31 in terms of score associated with the processed cards and sends such data item to the display screen 18' and to the further memory unit 36, if any (if so requested by a user).

[0029] An algorithm 38 (of the comparison type) makes it possible for the processor unit 32 to identify the type of playing card and its respective score, thanks to the fact that said algorithm compares the data (i.e. the images) detected by the optical sensor 31 to the contents of the storage 34, which contains the information relevant to the types of cards (in fact, the algorithm queries the storage and makes a comparison of dots of the image detected by the optical sensor with the corresponding dots of the images saved in the memory 34) and associates the contents of the memory 34', i.e. the value of the card as a function of the type of game therewith, also in this case by way of a query to the memory 34'.

[0030] According to alternative embodiments, the mentioned algorithm 38 might implement neural networks.

[0031] A user might interface to the central unit 30 via a keyboard 18" and set the type of game and the type of cards to be scored.

[0032] The score data stored in the further memory 36 can be used by the processor unit to draw up a list of the scores relevant to the individual rounds, a list that is displayed on the display screen 18'.

[0033] A user can save the results of the rounds on an external storage device or on similar media, by way of a connection interface 20, if any, thereby being it possible to maintain a file with the history of the rounds played and their respective scores or, alternatively, the results of the rounds might be sent to a remote device (such as a tablet, smartphone, or the like) wirelessly, by using data transmission means for wireless networks of the Bluetooth, 3G, or 4G type or the Wi-Fi network, and said remote device, via an expressly developed software program, will make it possible to display and process the results of the round(s) of the card game.

[0034] The use of an automatic counting device for card games according to the invention, as described above with reference to its structural characteristics, is explained below.

[0035] A user (a player) puts a pack 22 of cards to be scored in the compartment or hopper 14, sets the type or suit of cards and the type of game for which score calculation is requested via an (analog or digital) keyboard, and starts the device.

[0036] The counting device, via the card dragging and moving means, "fans" the cards one by one and moves them towards the further output compartment 16 by making them pass through in correspondence with the optical sensor 31 which scans the image of the playing card and sends it to the central unit 30, wherein said card is identified, and a related score or value is associated therewith

on the basis of the type of game set by the user.

[0037] The central unit 30 recognizes the card by way of the algorithm 38 and associates its respective value therewith, processes the scores or values of the individual cards detected by the sensor, and calculates the total score associated with the pack of cards 22 on the basis of each specific game; the value for the score is sent to the display screen 18' and is stored in the memory 36, if any, if applicable or if so set.

[0038] The user, after calculating the score of the mentioned pack of cards, can proceed further and calculating the score of the further pack of cards of another player involved in the game; the different scores of the different score calculations made are stored in the memory of the central unit 30 and displayed on the display screen 18' for displaying the scores relevant to a hand of cards.

[0039] The scores of the individual rounds are stored by the device in a further memory 36 and can be displayed on the display screen 18' for displaying the scores relevant to a sequence of hands (for instance three rounds) which make up a specific card game.

[0040] With reference to figure 4, this one schematically shows a typical use of the automatic counting device of the invention in a playing card tournament context.

[0041] As a matter of fact, figure 4 schematically shows the use of several automatic counting devices 10 (a number "n" of said counting devices) organized into a network, distinct from each other and arranged in correspondence with different card tables present in one and the same room or in different rooms of one and the same location or of different locations, each of said counting devices being in communication with a central processor 40 by a link through the internet network or another known data communication means, so as to define a network, the mentioned central processor collecting the scoring data of the individual counting devices 10 and displaying it on a central screen 42 which basically defines a scoreboard suitable for showing a list of the scores of the individual card tables that each individual counting device is associated with. Moreover, the central processor 40 is able to send to the individual devices 10 the global scores relevant to the individual tables involved in the tournament, being it possible to display said global scores on the display screens 18' of the individual counting devices 10.

[0042] Apparent are from the foregoing the advantages achievable by the automatic counting device for playing cards according to the present invention.

[0043] The automatic counting device for playing cards according to the present invention advantageously makes it possible to simplify and speed up the calculation of the scores associated with the cards used in a specific card game; as a matter of fact, a user shall simply put a pack of cards in the device, which takes care of scoring it.

[0044] A further advantage of the counting device according to the invention consists in that such automatic scoring zeroes the possibilities of errors in score calculation and avoids the need for repeatedly checking the

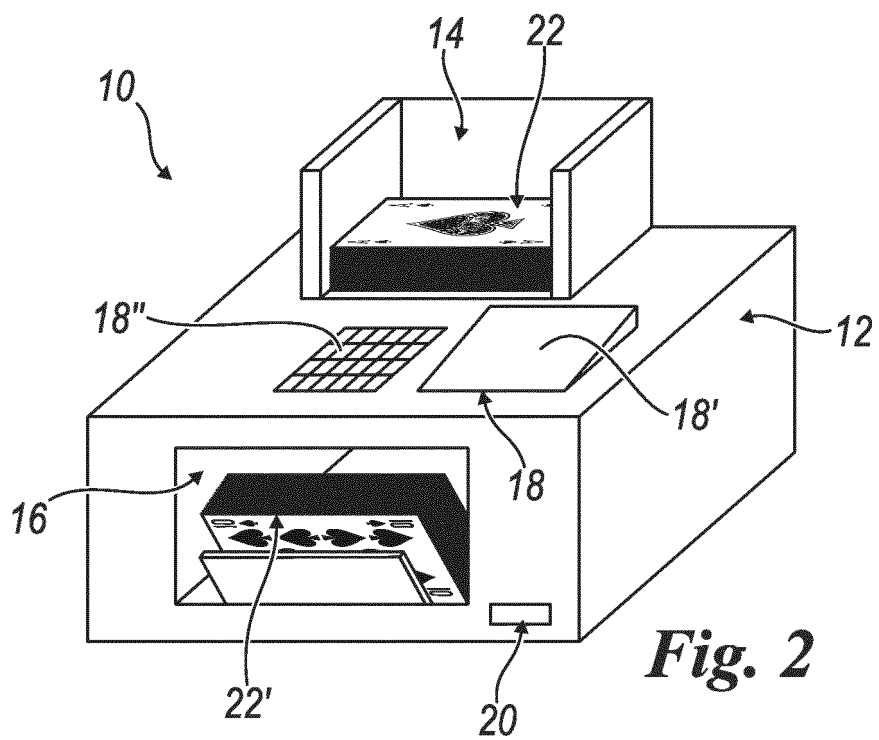
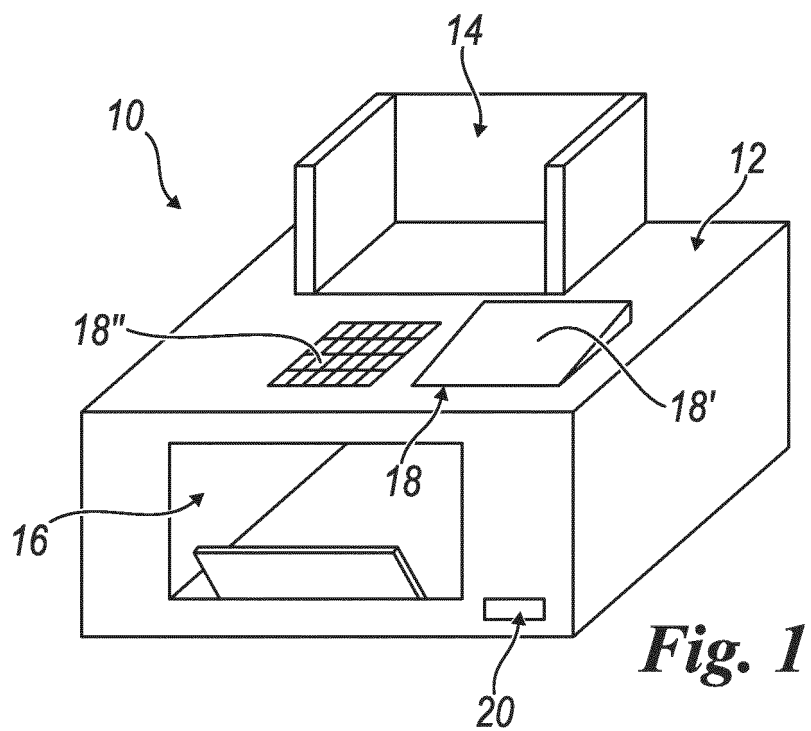
calculated scores which, on one hand, extends the times of the rounds and, on the other hands, increases the possibilities or errors in calculating the scores (resulting from player's distractions, nerves, or tiredness, or the like).

[0045] Further advantageous is the fact that the device according to the invention can be connected in a network for managing the calculation of the scores of the rounds of card game during a card tournament. Whereas the invention has been described here above with reference to one embodiment thereof, provided for explanatory, non-limitative purposes only, numerous modifications and variants will be apparent to those skilled in the art in the light of the above description. Therefore, the present invention aims at embracing all modifications and variants that fall within the scope of the following claims.

Claims

1. An automatic counting device (10) for playing cards comprising a body (12) defined by a box-like element internally to which the playing cards to be scored pass through, a compartment or hopper (14) for housing the playing cards to be scored organized into a pack (22), a further compartment (16) for receiving and accumulating the scored cards, also organized into a further pack (22'), mechanical dragging and moving means for dragging and moving the cards from the compartment or hopper (14) to the further compartment (16), and **characterized in that** it comprises at least one optical detector or optical sensor (31) suitable for reading the image of the card and the suit printed thereon and for sending the detected information to a central unit (30) suitable for receiving the data detected by said at least one optical detector or optical sensor (31) and for processing it, a user interface (18) and connection means (20), if any, comprising serial communication interfaces for connecting to peripherals or storage systems, and data transmission means for wireless networks for communicating with a remote device.
2. The counting device according to claim 1, **characterized in that** the dragging and moving means for dragging and moving the cards from the compartment of hopper (14) to the further compartment (16) comprise rollers or belts suitable for picking-up or "fanning" one playing card at a time from the pack (22) and for driving it in correspondence with the identification means.
3. The counting device according to claim 1, **characterized in that** the optical detector or sensor (31) is of the CCD (Charge Coupled Device) or CMOS (Complementary Metal Oxyde Semiconductor) type with a possible use of an ETTR (Expose To The Right) technique.

4. The counting device according to one or more of the previous claims, **characterized in that** the user interface (18) comprises a display screen (18') and a keyboard (18'').
5. The counting device according to claim 4, **characterized in that** the display screen (18') is a touch-screen one and supplements the keyboard (18'').
6. The counting device according to one or more of the previous claims, **characterized in that** the central unit (30) comprises a processor unit (32), one or more memories (34, 34') suitable for storing the data relevant to the various types or suits of cards and to the various types of card games, a further memory (36), if any, wherein the results of the processing made by the processor unit (32) are stored, said processor unit (32) processing the optical readings made by the optical sensor (31) in terms of score associated with the processed cards, the display screen being suitable for displaying said score values and for storing them in the further storage unit (36), said processing being performed by way of an algorithm (38) which enables the processor unit (32) to recognize the type of playing card and its respective score by way of a query made to the memory (34, 34').
7. The counting device according to one or more of the previous claims, **characterized in that** the connection means (20) comprise serial communication interfaces such as an USB (Universal Serial Bus) port for adding a physical device such as an external memory or for connecting to peripherals of other types (printer or the like).
8. The counting device according to one or more of the previous claims, **characterized in that** the communication means for communicating with a remote device are of the Wi-Fi or Bluetooth type or the like for a communication with a remote device.
9. The counting device according to any of the previous claims, wherein its operation comprises the following steps:
 - putting the pack (22) of cards to be scored into the compartment or hopper (14), setting the type or suit of cards and the type of game for which score calculation is required, and starting the device;
 - "fanning" the cards by way of the card dragging and moving means and moving said cards in correspondence with the optical sensor (31) towards the further output compartment (16), said sensor scanning the image of the playing card and sending it to the central unit (30);
 - making the processor unit (32) recognize the card and assign its respective score on the basis of the type of game by way of the algorithm (38) which compares the data detected by the optical sensor (31) with the contents of the memories (34, 34');
 - sending the score to the user interface (18) and displaying it on the display screen (18'); and
 - storing it, if any, in the memory (36), if any.
10. A network formed of "n" automatic counting devices according to any of the previous claims, **characterized in that** it comprises a central processor which collects the score data from the individual devices (10) and displays it on a central screen (42), and/or said central processor (40) being able to send to the individual devices (10) the global scores relevant to the individual devices (10) in order for them to be displayed on the user interface (18) of each individual device (10), said devices (10) being distinct from each other and located in different positions.



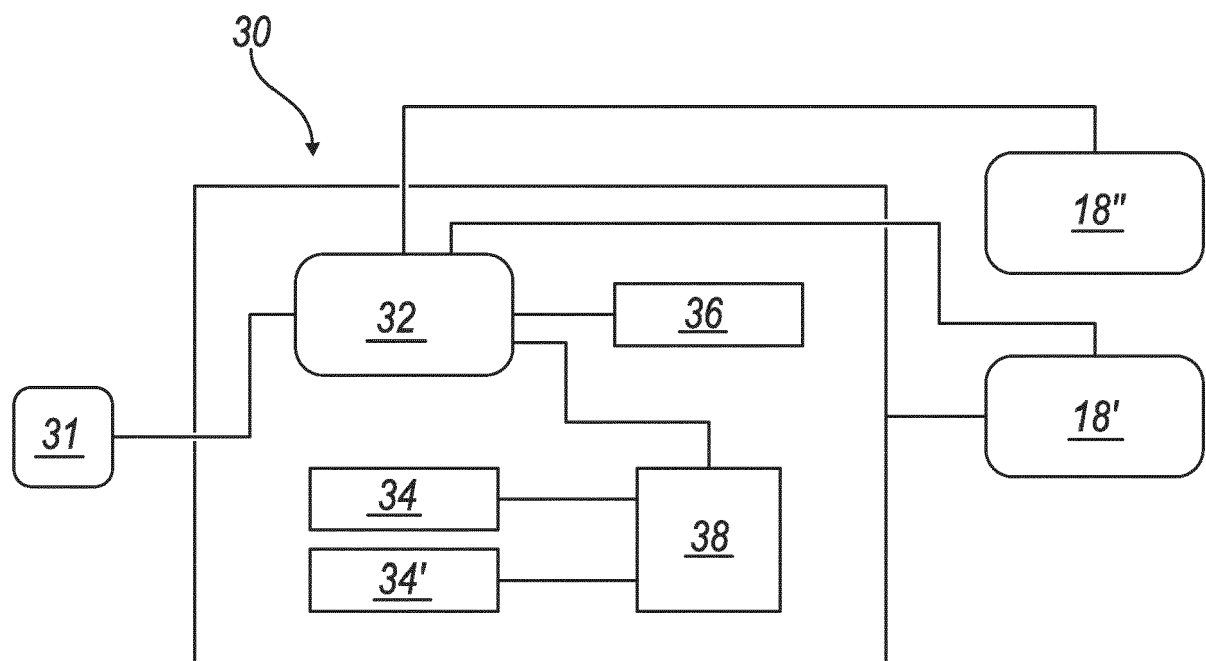


Fig. 3

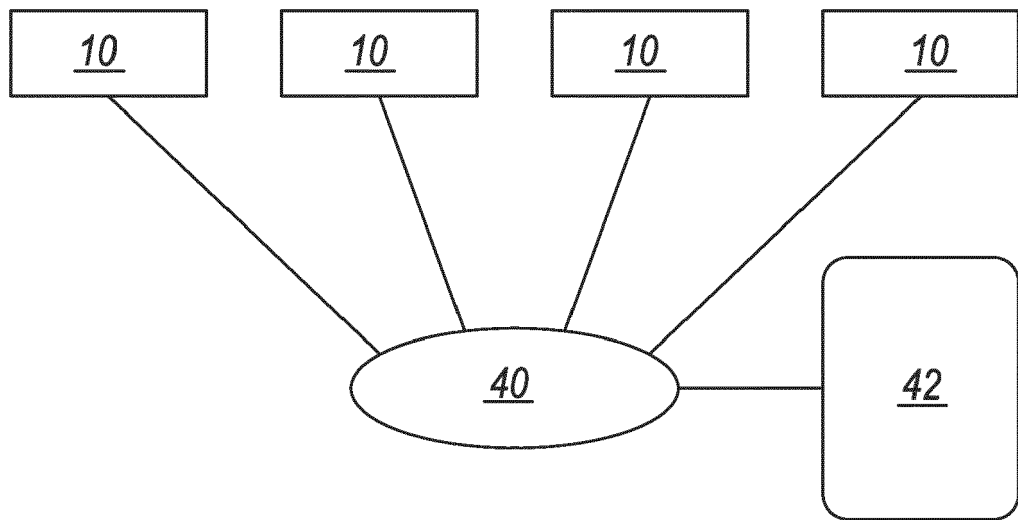


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 17 20 8103

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Place of search		Date of completion of the search	Examiner
The Hague		8 March 2018	Gélébart, Yves
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 20 8103

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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