

SMARTBOARD AND SET FOR DIGITALIZING WORKSHOP RESULTS

Technical field

The invention relates to a smartboard for digitising workshop results including a first and a second surface, which are designed parallel to one another. The invention also relates to
5 different sets including such smartboards.

State of the art

Work surfaces used by workshops are for example whiteboards, pinwalls, blackboards or tables. Participants for example note down their ideas on pieces of paper and attach them to these conventional work surfaces such as whiteboards or pinwalls, so that all can see them.
10 Subsequently evaluation is performed, duplicate ideas are removed, similar ones are pooled, important ones are embellished with further ideas. Depending on the purpose of the workshop sequences are determined and/or priorities are set and finally tasks and responsibilities are assigned.

Such workshops are frequently accompanied by facilitators, equipped with facilitator's cases,
15 which are well equipped with self-adhesive post-its of different colours and shapes, coloured dots, magnetic buttons, markers, scissors, pins etc. The work results can at best, be recorded photographically. Following completion however, they are not used any further, the work surface is again emptied.

On the other hand electronic whiteboards, here called smartboards, are known, which are
20 equipped with electronics for performing various additional functions. There are known to be boards, which like a tablet comprise a touchscreen, character recognition and so on. These allow previously produced graphics to be supplemented by hand-written remarks and to be stored in amended form. Such smartboards are however very expensive and cannot, in contrast to a facilitator's case, be simply brought along by a facilitator.

25 Summary of the invention

It is the objective of the present invention to describe a smartboard of the kind mentioned in the beginning for digitising workshop results, which is portable and which can send work results in digitised form to a computer for the computer to further process them.

The invention is solved by the characteristics of the first patent claim. According to the invention a plurality of pockets are arranged in parallel to one another between the first and the second surface of a smartboard described at the beginning, wherein each pocket has one or more electrically interconnected printplates are arranged in it, which include a plurality of
5 NFC receivers in an array. Moreover each pocket has a plurality of magnets in form of ferromagnets or permanent magnets arranged in it in an array, wherein the printplates of adjacent pockets are electronically connected to each other, preferably meanderingly. A first of the printplates is moreover provided with a port for a power supply and for a data output.

A set according to the invention includes such a smartboard and at least two or more objects,
10 wherein each object includes at least one magnet in form of a permanent magnet or ferromagnet as well as at least one, preferably two RFID transponders.

Short description of the drawings

The invention is illustrated below in various drawings and explained in more detail with the aid of reference symbols explained further below, in which:

- 15 Fig. 1a, 1b shows a schematic depiction of an inventive smartboard connected to a computer with a view onto the first surface (fig. 1a) and onto the second surface (fig. 1b);
- Fig. 2 shows a schematic internal view of such a smartboard;
- 20 Figs. 3a, 3b show a schematic partial view of an internal view of a smartboard in two alternative forms;
- Fig. 4 shows a schematically drawn cross-section through a partial region of a smartboard, at different points;
- Fig. 5 shows a schematically drawn cross-section through a rolled-up smartboard;
- Fig. 6 shows a schematic view of an inventive object in form of a card;
- 25 Fig. 7 shows a schematic view of an inventive object in form of a can with an internal space;
- Figs. 8a, 8b show a schematic view of an inventive connecting element in two embodiments;
- Fig. 9 shows a schematic view of an inventive smartbook on a smartboard;
- 30 Figs. 10a, 10b show a schematic view of an inventive clipboard (a) and a suitable sheet of paper (b).

Ways of implementing the invention

Figs. 1a and 1b each show an inventive smartboard 1 for digitising workshop results, including a first surface 2 and a second surface 3, which are designed parallel to one another.

Such a smartboard 1 can be placed either on a table or hung from a wall or a conventional whiteboard, wherein this can be accomplished by means of eyelets 1a provided on the smartboard 1. Working with the smartboard 1 is possible horizontally or vertically.

Fig. 2 shows the inside of such a smartboard 1, figs. 3a and 3b show an enlargement of individual segments thereof. Between these surfaces 2, 3 a plurality of pockets 4 are arranged in parallel to one another, which are connected with each other at joints 5. One or more electrically interconnected printplates 6 are arranged in each pocket 4, the printplates including a plurality of NFC receivers 7 in an array. Also, each pocket 4 has arranged in it a plurality of magnets 8 in an array in form of ferromagnets or permanent magnets. They may be mounted in recesses 13 provided in the printplates 6 for this purpose. If permanent magnets, in particular rod-shaped ones, are chosen as magnets 8, it is advantageous if these are mounted in such a way that they are capable of aligning themselves. Preferably the NFC receivers 7 and the magnets 8 are arranged respectively in an alternating manner in the array. As depicted in figs. 3a and 3b, printplates 6 within a pocket 4 can for example be plugged into each other at electrical connections 9a, so that they are electronically contacted with each other. Fig. 4 shows a cross-section of individual pockets 4 in the region of the printplates 6 and the magnets 8.

The printplates 6 of adjacent pockets 4 are connected with each other at electronic connections 9a, preferably meanderingly as depicted in fig. 2. A first of the printplates 6a is provided with a port 9 for the connection to a power supply 10 and for a data output for the purpose of transmitting data for example to a computer 10.

Moreover one or more switches 15, preferably pressure switches, which can be triggered by a user, may be arranged in the pockets 4. In a preferred embodiment each NFC receiver 7 is assigned its own switch 15, as depicted in fig. 3b. Depending on the construction of the switch 15 it may be designed such that it can be actuated optionally from the first and/or the second surface 2, 3 by a user pressing it, or two switches 15 may be arranged opposite each other, as

shown in the right-hand part of fig. 4. Each switch 15 is also connected to the port 9 for data output.

Since the pockets are hingedly connected with each other, the smartboard 1 can be rolled into a roll 11 with an axis 12 parallel to the elongate pockets 4, as shown in fig. 5. Preferably the pockets 4 comprise pressure-proof housings 14, in which the printplates 6 and the magnets 8 are protectively arranged. Ultimately the switches 15 are attached to these housings 14 so as to be actuated from outside, for example by pressing them.

Preferably at least the first surface 2 consists of a flexible material, in particular a textile material such as a felt mat 2a, so that this surface 2 can be perforated by a pin or a needle.

Thus it is easy to write information on a slip of paper and pin it to the smartboard 1.

Alternatively or additionally thereto at least the second surface 3 may consist of a pressure-proof material, preferably of plastic plates 3a. Preferably this is designed to be low-gap when the smartboard 1 is completely unwound. This second surface 3 can be easily written on with wipe-off markers, and self-adhesive post-its can be attached to it. It is also possible to design both surfaces 2, 3 in an identical manner.

Such a smartboard 1 is now suitable for working with. Information can be attached in different ways to the smartboard 1. The described or equipped smartboard 1 can be expanded in a modular manner by further modules 17, 19, 21, 23, 25, 28 described here, which together with the smartboard 1 form a set 16. Each of these modules 17, 19, 21, 23, 25, 28 can however also be used on its own or in connection with other such modules 17, 19, 21, 23, 25, 28 or with components not named here. The purpose shall always be to organise, store and forward information while working as a group or on a project. As a rule a coach would lead and accompany such group work and explain to the participants the method of working with the smartboard 1 and the modules 17, 21, 23, 25, 28.

Thus for example information can be written onto magnetically attached modules 17, 19, 21, 23, 25, which adhere to the magnets 8 in the smartboard 1. The information could also be placed on top of each other, collated into groups, or be organised into a logical sequence. Additional information can also be attached directly to the smartboard 1.

An inventive set 16 includes for example a smartboard 1 as well as two or more objects 17 representing modules, as depicted in fig. 6 or 7. As a rule a plurality of such objects 17 is

used. Each of these objects 17 includes at least one magnet 8 in form of a permanent magnet or a ferromagnet as well as at least one, preferably two RFID transponders 18. Optionally the objects 17 may also include a switch 15, in particular a pressure switch.

5 In a first preferred embodiment as per fig. 6 one or more of these objects 17 may be realised as cards 19. The cards 19 have for example the size and shape of credit cards or business cards. In a preferred embodiment they comprise a coding 20, for example in form of notches. Such codings 20 can help to separate cards 19, which belong to a group and which all comprise the same coding 20, from other cards 19. To this end the cards 19 are placed into
10 boxes provided for this purpose, which comprise grooves on the bottom, which correspond to the notches 20 of a respective group. Cards 19, which do not belong to this group and therefore have a different coding 20, abut against at least one of the grooves and as a result stand out in relation to the other cards 19, which at these points comprise a notch 20. This allows them to be easily sorted out.

15 An additional colour coding on the side could for example mark the sequence of the cards 19, if the colour coding of each subsequent card 19 is slightly offset from that of the previous card. This makes it very easy to control the sequence.

As an alternative to the design as a card 19 the objects 17 could be designed as a can 23 with a housing 24 and with an interior space 24, as shown in fig. 7. A can 23 is easier to grip than a card 19. The interior space 24 of each can 23 may accommodate the one or more RFID
20 transponders 18 and the magnet 8, and a switch 15 may in addition be attached to the can 23. The magnet 8 is preferably realised as a permanent magnet and mounted in the interior space 24 such that it can freely align itself. It is also possible to provide a number of magnets 8. Further suitable electronic components can be arranged on a printplate 6. The can 23 may for example have a LED 31, which gives feedback following actuation of the switch 15. The
25 supply for this can be run via the RFID transponders 18 from the smartboard 1. The cans 23 protect the components arranged in the interior space 24 against the impact of external forces and contamination.

Such objects 17 or cards 19 may already have been written on or be written on whilst working. Thanks to their magnets 8 they adhere to the smartboard 1. Their RFID transponders
30 18 correspond with the NFC receivers 7. This allows a computer 10 attached to the smartboard 1 to be sent the ID number of the card 19 as well as the position on the smartboard

1, to which it adheres. The card 19 may be assigned further properties, which are stored in a database, which can be accessed by the computer 10. In addition further actions may be initiated, if for example a switch 15 of the smartboard 1 is actuated, before a card 19 is attached thereto. Visual or other information can be retrieved or assignments may be made to the ID number of the respective card 19. For example an assignment may be created such as «the next photo, which is taken by a camera assigned to the smartboard 1, is linked in a database to the ID number of that card 19, which was attached to the switch 15». Thus for example the picture of a person, which shall be appointed as project manager, or a picture of an architectural model, the realisation of which shall take place, may be assigned to a card 19. When actuating the switch 15 again, the corresponding picture can be shown on the display. If a number of cards 19 are arranged one above the other, the corresponding pictures of all these cards 19 are displayed. These are just a few examples. A management system may contain a plurality of presentation programs, which execute various instructions for work with the smartboard 1 and the different objects 17, 19, 21, 23, 25, 28. Correspondingly a management system may include one or more boxes of cards 19 of different groups, wherein the ID numbers of individual cards 19 have already been recorded in a database and brought into correlation with certain information.

A further inventive set 16 again includes a smartboard 1 and objects 17, as described above. In addition it includes one or more connecting elements 21 depicted in figs. 8a and 8b. A connecting element 21 includes two objects 17 connected with each other by a connecting ribbon 22. The connecting ribbon 22 merely represents a visual and structural connection of the objects 17, it may be elastic. The objects 17 may be realised as cards 19 or as cans 23, as shown in fig. 8a. When the two end points of the connecting ribbon 22 with the magnets 8 of the objects 17 are placed on the smartboard 1, an assignment can be created linking the two places of these end points with one another. This may mean a temporal sequence, a hierarchy, a togetherness or similar. The cans 23 may be realised as described in fig. 7. In particular they may comprise a housing 14 with an interior space 24.

With a preferred embodiment of a connecting element 21, as shown in fig. 8b, one or two further such objects 17 are movably attached to the connecting ribbon 22. If only one object 17 has been attached, it may be understood as being a percentage value: a placing of the movable object 17 in the middle between the ends of the connecting ribbon 22 means 50%, a movement by a half to one end 25% or 75% respectively depending on the predefined starting

position. The scaling cannot be resolved to a randomly fine value; the placing is detected by the NFC receivers 7 based on the placing of the RFID transponders 18.

If two objects 17 are movably arranged in the connecting ribbon 22 as shown in fig. 8b, this can be for example interpreted as a region between minimum and maximum, which are respectively defined by the objects 17 at the ends of the connecting ribbon 22. Detection of the positions on the smartboard 1 happens in the same way as with a movable object 17. The connecting elements 21 may optionally be placed directly on the smartboard 1 or on cards 17 if such objects are already arranged on the smartboard 1.

The objects 17 of a connecting element 21 may be optionally realised as card 19 as described in fig. 6, or as can 23 with an interior space 24 as described in fig. 7.

In a further preferred embodiment a set 16 or a smartboard 1 includes an object 17 in form of a smartbook 25 as shown in fig. 9. The prerequisite is that each NFC receiver 7 of the smartboard 1 has its own switch 15 assigned to it. A smartbook 25 includes a plate 26, the length of which extends across two or more array distances of switches 15 in the smartboard 1 and/or the width of which extends across two or more pockets 4. The plate 26 comprises a number of magnets 8 in form of ferromagnets or permanent magnets arranged in an array or grid as well as at least two RFID transponders 18 analogue to card 19 from fig. 6. In addition a multi-page notebook 27 is attached to it, the pages of which are provided with instructions and choice variants 27a. Each of these variants 27a may have a switch 15 of the smartboard 1 assigned to it, which is arranged directly around the smartbook 25, if, when in use, it adheres to the smartboard 1. When actuating these switches 15 additional information is retrieved, which in turn may contain instructions. In addition a switch 15 may be defined, which is to be actuated when the page is completed. The page is then turned and the instructions of the next page are followed after further additional information has been retrieved.

Such smartbooks 25 may be manufactured for different workshops or projects and may guide the user or users through a process, for example through a decision process. The different aspects (price, quality, demand, risk etc.) may be respectively illuminated on a page and the variants, which are available to the users for selection, may be assigned to the surrounding switches 15 on the smartboard 1. The smartboard 1 recognises the position of the smartbook 25 with the aid of the two RFID transponders, which correspond with the NFC receivers on

the smartboard 1. Here too all information, which is entered by the users on the smartboard through actuating the switches 15, is sent to the computer and processed further in there.

Moreover a clipboard 28 as shown in fig. 10a can be used as an additional module with the smartboard 1 or with a named set 16. A clipboard 28 consists of a base 29 with a fastening 29a for a sheet of paper 30 as depicted in fig. 10b and is provided with at least one, preferably two RFID transponders 18. The sheet of paper 30 itself also includes one or two RFID transponders 18, wherein at least one RFID transponder 18 each of the base 29 and of the paper sheet 30 are arranged to be close to each other for communication, when the sheet of paper 30 is fixed to the fastening 29a. Preferably the base 29 comprises a marking 30a, which indicates where exactly the sheet of paper 30 is to be placed. The base 29 may also include a plurality of switches 15, preferably arranged in a matrix. They may be marked or arranged hidden behind a surface. As with the smartbook 25 the sheet of paper 30 may also be part of an accumulation of prefabricated sheets of paper 30. Each of these sheets 30 is provided with various information, instructions and choice variants 27a as well as with a number of marking fields 15a, which are respectively arranged at the locations of the switches 15 of the clipboard 28, when the sheet 30 is fastened at the marking 30a of the base 29. The user respectively actuates, depending on the situation, the corresponding switches 15 by for example pressing them. In fig. 10b the marking fields 15a, which he can selectively actuate, are marked by circles arranged below the letters A, B and C. Further marking fields 15a are located where to the crosses are in the lower table. Depending on what is applicable the user actuates the corresponding switches 15 on the clipboard 28, by pressing on the marking fields 15a.

The clipboard 28 additionally includes a port 9, which may also be a wireless interface, with which the recorded data is transmitted to a computer 10.

The clipboard 28 may also include one or more LEDs 31 in order to give feedback for actions performed or in order to receive information. For example a lit LED 31 may indicate that information regarding a certain subject matter is displayed on a screen.

The set 16 including a smartboard 1 and an object 17, wherein the object is a card 19, a can 23, a connecting element 21 or a clipboard 28, is not marked as such in the figures. The objects 19, 21, 23 and 28 are merely shown on their own, without smartboard 1. Only the set 16 including a smartboard 1 and a smartbook 25 is depicted in fig. 9. All objects 17, 19, 21,

23, 25 and 28 described here according to the invention may also be used on their own or in combination with other objects 17, 19, 21, 23, 25 und 28.

List of reference symbols

	1	smartboard	1a	eyelets
	2	first surface;	2a	felt mat
	3	second surface;	3a	plastic plate
5	4	pocket		
	5	joint		
	6	printplate	6a	first printplate
	7	NFC receiver		
	8	magnet, ferromagnet or permanent magnet		
10	9	port	9a	electrical connection
	10	power supply, computer		
	11	roll		
	12	axis		
	13	recess		
15	14	housing	14a	housing part
	15	switch, pressure switch	15a	marking field for a switch
	16	set		
	17	object		
	18	RFID transponder		
20	19	card		
	20	coding, notch		
	21	connecting element		
	22	connecting ribbon		
	23	can		
25	24	interior space		
	25	smartbook		
	26	plate		
	27	notebook	27a	information, instructions, choice variants
	28	clipboard		
30	29	base	29a	fastening
	30	sheet of paper	30a	marking for a sheet of paper
	31	LED		

Patent Claims

1. A smartboard (1) for digitising workshop results, including a first and a second surface (2, 3), which are designed parallel to one another, characterised in that
5 between these surfaces (2, 3) a plurality of pockets (4) are arranged parallel to one another, wherein in each pocket (4) one or more electrically interconnected printplates (6) are arranged, which include a plurality of NFC receivers (7) in an array, wherein a plurality of magnets (8) in form of ferromagnets or permanent magnets are also arranged in an array in each pocket (4), wherein the printplates (6) of adjacent pockets (4) are electronically connected with each other, preferably meanderingly, and a first of
10 the printplates (6a) is provided with a port (9) for a power supply (10) and for a data output.
2. The smartboard (1) according to claim 1, characterised in that the pockets (4) are hingedly connected to each other, so that the smartboard (1) can be rolled up into a roll (11) with an axis (12) parallel to the pockets (4).
- 15 3. The smartboard (1) according to claim 1 or 2, characterised in that the printplates (6) comprise recesses (13), in which the magnets (8) are mounted.
4. The smartboard (1) according to claim 3, characterised in that the magnets (8) are permanent magnets, preferably rod-shaped magnets, wherein they are mounted such that they are capable of aligning themselves.
- 20 5. The smartboard (1) according to one of the preceding claims, characterised in that the pockets (4) comprise pressure-proof housings (14), in which the printplates (6) and the magnets (8) are located.
6. The smartboard (1) according to one of the preceding claims, including one or more switches (15), which can be triggered by a user, the switches being preferably pressure
25 switches, which are connected to the port (9) for data output.
7. The smartboard (1) according to claim 6, characterised in that each NFC receiver (7) has its own switch (15) assigned to it.
8. The smartboard (1) according to claim 7, characterised in that each switch (15) can optionally be actuated from the first and/or second surface (2, 3) by a user pressing it.

9. The smartboard (1) according to one of the preceding claims, characterised in that at least the first surface (2) consists of a flexible material, in particular from a textile material, and preferably from a felt mat (2a), which can be perforated by a pin or a needle.
- 5 10. The smartboard (1) according to one of the preceding claims, characterised in that at least the second surface (3) consists of a pressure-proof material, preferably of plastic plates (3a).
11. The smartboard (1) according to claim 10, characterised in that the second surface (3) forms a low-gap surface, when the smartboard (1) is completely unwound.
- 10 12. A set (16) including a smartboard (1) according to one of the preceding claims as well as two or more objects (17), wherein each object (17) includes at least one magnet (8) in form of a permanent magnet or ferromagnet as well as at least one, preferably two RFID transponders (18).
13. The set (16) according to claim 12, characterised in that one or more of the objects (17) also includes a switch (15), in particular a pressure switch.
- 15 14. The set (16) according to claim 12 or 13, characterised in that one or more of the objects (17) are realised as a card (19) and comprise a coding (20), preferably in form of notches.
15. The set (16) according to claim 12 or 13, characterised in that two of the objects (17) are connected with each other by a connecting ribbon (22) to form a connecting element (21).
- 20 16. Set (16) according to claim 15, wherein one or two further such objects (17) are movably attached to this connecting ribbon (22) of the connecting element (21).
17. The set (16) according to one of claims 15 or 16, characterised in that each object (17) of a connecting element (21) is realised as a can (23) with an interior space (24).
- 25 18. The set (16) according to claim 17, characterised in that all magnets (8) of these objects (17) are realised in form of permanent magnets and mounted in the interior space (24) such that they can freely align themselves.

19. The set (16) including a smartboard (1) according to one of claims 7 to 11, or a set (16) according to one of claims 12 to 18 with reference back to claim 7, including a smartbook (25) with a plate (26), the length of which extends across two or more array distances of switches (15) in the smartboard (1) and/or the width of which extends across two or more pockets (4), wherein the plate (26) comprises several magnets (8) in form of ferromagnets or permanent magnets arranged in an array or grid as well as at least two RFID transponders (18), wherein a multi-page notebook (27) is attached to the plate (26), the pages of which are provided with instructions and choice variants, wherein each variant (27a) may have a switch (15) of the smartboard (1) assigned to it, which, when in use the smartbook (25) is attached to the smartboard (1), is directly arranged around the smartbook (25).
20. The smartboard (1) according to one of claims 1 to 11 or set according to one of claims 12 to 19, comprising a clipboard (28) realised as a base (29) for a sheet of paper (30) and a fastening (29a) therefore, wherein the base (29) is provided with at least one, preferably two RFID transponders (18), as well as at least one sheet of paper (30) with a RFID transponder (28), wherein a RFID transponder (18) each of the base (29) and of the paper (30) are arranged so as to be close to each other for communication.
21. The smartboard (1) or Set (16) according to one of the preceding claims, characterised by at least one LED (31), which can indicate feedback for performed actions.
22. A clipboard (28) realised as a base (29) for a sheet of paper (30) and a fastening (29a) therefore, wherein the base (29) with provided with at least one, preferably two RFID transponders (18), as well as at least one sheet of paper (30) with a RFID transponder (28), wherein a RFID transponder (18) each of the base (29) and of the paper (30) are arranged so as to be close to each other for communication, when the sheet of paper is fixed to the fastening.
23. The clipboard (28) according to claim 22, characterised by at least one LED (31), which can indicate feedback for actions performed.
24. The clipboard (28) according to claim 22 or 23, characterised by a marking (30a) on the base (29), which indicates, where exactly the paper is to be placed.

- 25. The clipboard (28) according to one of claims 22 to 24, characterised in that the base (29) includes a plurality of switches (15), which are preferably arranged in a matrix.
- 26. The clipboard (28) according to claim 22, characterised in that the switches (15) on the base (29) are marked or arranged hidden behind a surface.
- 5 27. The clipboard (28) according to one of claims 25 or 26, characterised in that the sheet (30) is provided with various information, instructions and/or choice variants (27a) as well as with a number of marking fields (15a), which are respectively arranged at the locations of the switches (15) of the clipboard (28), when the sheet (30) is fastened on the marking (30a) of the base (29).
- 10 28. The clipboard (28) according to one of claims 25 to 27, characterised by a port (9), which may be a wireless interface, with which the recorded data is transmitted to a computer (10).
- 29. The clipboard (28) according to one of claims 24 to 28, characterised in that the sheet of paper (30) is part of an accumulation of prefabricated sheets of paper (30).
- 15 30. The clipboard (28) according to one of claims 24 to 29, characterised in that each switch (15) is realised as a push button.