FIG. 4
before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
Electricity-conductive toy dart to interact with capacitive touchscreen devices for interactive gaming

FIELD OF INVENTION
This invention relates generally to toy projectiles, and more particularly, to a toy dart that can be thrown and/or "shot" towards a capacitive touchscreen device, and generate a digital gesture at the place of impact.

BACKGROUND
Touch sensitive devices, and capacitive touchscreen devices in particular, are becoming popular among adults, youth and children, because of their versatile operating possibilities, competitive pricing and accessible daily solutions. Touch sensitive devices, like smart TV's, Tablets, Smartphones, etc. can generally allow a user to perform various functions by touching the touch sensor panel using one or more fingers, physically holding a stylus or other electricity conductive object at a location often dictated by a user interface (UI). In general, touchscreens can recognize a touch event and the position of the touch event on the touch sensor panel, and the computing system can then interpret the touch event in accordance with the display appearing at the time of the event.

In this context, accessories, such as, stylus and/or interactive game pieces are invented especially to interact with capacitive touch surface devices. These products are often made from conductive materials, and are designated to expand using possibilities and/or improve user experience on a touch-sensitive surface.

US8, 125,469 titled "Passive stylus for capacitive sensors" discloses a passive stylus for capacitive sensors comprises a tip and a shaft. The tip is configured to couple electrically with a capacitive sensing device and to couple physically and electrically with the stylus shaft. However, in order to generate a digital gesture for the touch-sensitive surface at the place of touch, the said stylus
shaft configured to be held by a user while using the tip to touch the capacitive touch surface.

US2012/0007817 titled "Interactive game pieces using touchscreen devices for toy play" discloses a game piece comprises a plurality of touch points for touching a touch surface of a touch-sensitive system that can detect a plurality of contemporaneous touches on the touch surface and generate a digital gesture. However, the specified invention only relates to game pieces with plurality of touch points that are being placed continuously on a touch surface in order to generate an interactive digital gesture from the touchscreen device.

Furthermore, conventional toy guns that use spring and/or air pressure to launch an elongated foam and/or rubber dart, such as, Nerf from Hasbro®, and dart board on which a player throw a dart by hand, as disclosed in U.S 5,016,891 titled "Projectile-target game apparatus"; are a common game among children, youth and even adults. A player may choose to play against other players by "shooting" on each other or against a designated electrical sensing dart board that counts points according to player's accuracy or simply "shoot" in open space.

US7,537,001 titled "Toy gun for launching an elongated dart and a method of using pressurized air to launch an elongated dart from a toy gun" discloses a toy gun that uses air to launch an elongated dart having a rear bore. The elongated dart has a cylinder foam body and a suction cup or a rounded tip mounted on a front end thereof. The dart has a rare bore for placement over an inner post that is located in the toy gun barrel.

However, the specified invention is relating to "shooting" the dart in open spaces or on a "rival" player or on a flat surface, therefore, the dart is made from standard materials, such as plastics (ABS, Polypropylene) and/or foams (polyurethane), and/or rubber. Generally, none of the specified materials is a conductive material that has the electrical resistance required to attract a digital gesture from a capacitive touchscreen device at the moment and place of the touch event.
Accordingly, it would be advantageous to provide a soft conductive toy dart that is made from conductive materials, which can still be produced at a reasonable cost, and will have the electrical resistance required to generate a gesture from a capacitive touch surface at the place of impact. This invention introduces a toy projectile that can be "shot" and/or thrown at a touchscreen device, and interact with the touchscreen device at the place and time of impact, and more particularly, interact with a capacitive touchscreen device that is operating a digital dart game application or a "shooting range" game application, which will measure player's accuracy and will increase the amusement for the player.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention, both as to its organization and manner of operation, together with further objects and advantages, may best be understood by reference to the following description, taken in accordance with the accompanying drawings, of which:

- FIG. 1 is a side elevation view of a conductive toy dart with a preferred embodiment of the present invention;
- FIG. 2 is a side elevation view of a conductive toy dart with a preferred embodiment of the present invention, comprises a conductive vacuum cup portion coupled to the first end of the elongate body portion, and fins coupled to the second end of the elongate body portion;
- FIG. 3 illustrates a cross-sectional view of a conductive toy dart thrown by a player and impacts a capacitive touchscreen device, in accordance with an embodiment of the present technology;
- FIG. 4 illustrates a cross-sectional view of a conductive toy dart "shot" by a toy gun and impacts a capacitive touchscreen device, in accordance with an embodiment of the present technology;
- FIG. 5 a flowchart.
DETAILED DESCRIPTION OF INVENTION

An interactive apparatus for shooting soft conductive toy dart (22) towards a capacitive touchscreen device, configured to generate a digital gesture from capacitive sensing device at the place of impact, comprising of:

1. A soft conductive toy dart (22) made of conductive materials, consisting of an elongate body portion (7) with a first end (6) and a second end (23). Body portion (7) of soft conductive toy dart (22) is made of electric conductive materials, such as, but not limited to, types of foam, which consist of particles of coal and/or metal and/or silver and/or carbon fibers, that have the required electrical resistivity for operating capacitive touch sensors.

2. A conductive tip made of soft-resilient electric conductive materials. First end (6) of a soft conductive toy dart (22) is coupled physically and electrically with a conductive tip (8) that is made of soft-resilient electric conductive materials, such as, but not limited to, silicone and/or rubber and/or thermoplastic elastomer, consisting of particles of coal and/or metal and/or silver and/or carbon fibers, that have the required electrical resistivity for operating a capacitive touch sensor. Tip (8) of dart (22) includes a conductive resilient wall portion, consisting of preferred surface resistivity of $10^5$ Ohm/sq and above, which is required for operating the capacitive touch sensors. However, the preferred surface resistivity discussed herein is relevant for current capacitive touchscreen devices and may vary between different touch sensor technologies and/or future changes in capacitive touchscreen technology. Tip (8) of wall portion may be formed in a shape of a convex disk (9) and/or include a vacuum cup portion (10), in a preferred diameter size of 2mm and more, in order for it to be detected by touch sensors at the place of impact.

3. A fin made of non-electric conductive materials. A second end (23) of a soft conductive dart (22) may be coupled with fins (11), which may be required for performing its application and/or may be added as a design element. Fin (11) may be made from electric conductive materials, such as, conductive foam and/or soft-resilient conductive materials. However, fin (11) is located in the second end (23) of dart (22), and it is not
configured to touch a capacitive sensitive device at any time, therefore it may also be made from none-conductive materials.

4. A dart launcher as shown in Figs. 3 & 4. Soft conductive dart (22) may be thrown from player's hand (12) and/or "shot" from a dart launcher (16), such as, but not limited to, compressed air guns, spring dart guns and bow launchers. Soft conductive dart (22) is configured to be thrown and/or "shot" when its first end (6) and the coupled tip (8) are facing the target aimed to. Tip 8 of soft conductive dart (22) impacts a touchscreen device (13), and more particularly, touches a capacitive touch-sensing surface (14) at impact point (15). In this regard, tip (8) may be formed in vacuum shape cup (10), and enables dart (22) to touch touchscreen surface (14) at impact point (15).

In another embodiment of the invention, tip (8) is configured to couple electrically with a capacitive sensing surface (14) at impact point (15). Unlike a standard stylus for capacitive touchscreen device, conductive dart (22) is configured to generate a digital gesture from capacitive touchscreen device (13) at impact point (15) without any physical touch by user.

Soft conductive dart is configured to be thrown or "shot" when its first end, the coupled tip, is facing the target aimed to. The tip of soft conductive dart touches a capacitive touch-sensing surface at impact point, without any physical touch by user;

When conductive tip, charged with electric ions, touches the impact point, electric ions are discharged causing short circuit on touchscreen or on conductive tip thus identifying the impact point and changes capacitive of impact point and its surrounding of at least 1 Picofarad adapted to characteristics of target touchscreen like: graphics, sound, change of pictures etc, and activates pre-programmed visual reactions on touchscreen, like, display of calculated scores (speed, accuracy), advice of new challenges, statistics or any other desired data.

**DETAILED DESCRIPTION OF DRAWINGS**

FIG. 1 and FIG. 2, show a soft conductive toy dart (22) consisting of an elongate body portion (7) with a first end (6) and a second end (23). Body
portion (7) of a soft conductive toy dart (22) is made of electric conductive materials, such as, but not limited to, types of foam, which consist of particles of coal and/or metal and/or silver and/or carbon fibers, that have the required electrical resistivity for operating capacitive touch sensors. First end (6) of a soft conductive toy dart (22) is coupled physically and electrically with a conductive tip (8) that is made of soft-resilient electric conductive materials, such as, but not limited to, silicone and/or rubber and/or thermoplastic elastomer, consisting of particles of coal and/or metal and/or silver and/or carbon fibers, that have the required electrical resistivity for operating a capacitive touch sensor. Tip (8) of dart (22) includes a conductive resilient wall portion, consisting of preferred surface resistivity of $10^5 \text{ Ohm/sq}$ and above, which is required for operating the capacitive touch sensors. However, the preferred surface resistivity discussed herein is relevant for current capacitive touchscreen devices and may vary between different touch sensor technologies and/or future changes in capacitive touchscreen technology. Tip (8) of wall portion may be formed in a shape of a convex disk (9) and/or include a vacuum cup portion (10), in a preferred diameter size of 2mm and more, in order for it to be detected by touch sensors at the place of impact. A second end (23) of a soft conductive dart (22) may be coupled with fins (11), which may be required for performing its application and/or may be added as a design element. Fin (11) may be made from electric conductive materials, such as, conductive foam and/or soft-resilient conductive materials. However, fin (11) is located in the second end (23) of dart (22), and it is not configured to touch a capacitive sensitive device at any time, therefore it may also be made from none-conductive materials.

FIG. 3 and FIG. 4 show that a soft conductive dart (22) may be thrown from player's hand (12) and/or "shot" from a dart launcher (16), such as, but not limited to, compressed air guns, spring dart guns and bow launchers. Soft conductive dart (22) is configured to be thrown and/or "shot" when its first end (6) and the coupled tip (8) are facing the target aimed to. Tip 8 of soft conductive dart (22) impacts a touchscreen device (13), and more particularly, touches a capacitive touch-sensing surface (14) at impact point (15). In this...
regard, tip (8) may be formed in vacuum shape cup (10), and enables dart (22) to touch touchscreen surface (14) at impact point (15).

Referring to step 17 of the flowchart in figure 5, and in continuing reference to FIGS. 1-4, a player may "shoot" and/or throw soft conductive dart (22) at a capacitive touchscreen device (13) and at a touch surface in particular (14), when player is playing a sort of a "shooting range" game application or a "dart board" game application. Touchscreen device (13), such as, but not limited to, iPad from Apple®, is a common gaming console among children, youth and even adults. Touchscreen device (13) may operate a digital game application, and display the game application on capacitive touchscreen (14) in the form of graphics and animation. A digital game application reacts to player's touch and/or other user actions in accordance with a user interface settings, and then measures player's "success" according to each game and its requirements.

Referring to step 18 and step 19 of the flowchart in figure 5, and in continuing reference to FIGS. 1-4, a conductive toy dart (22) impacts capacitive touch surface (14) with its tip( 8). Conductive toy dart (22) is interfering the electrical field of capacitive touch surface (14), like, but not similar to, interference created by a human finger. The capacitive touch sensors detect a touch event at the place and time of impact (15), and transmit the data to the processor of touchscreen device (13) before generating a digital gesture.

Moving to step 20 and step 21 of the flowchart in figure 5, and in continuing reference to FIGS. 1-4, touchscreen device (13) generates a digital gesture in accordance with the place and time of impact (15) of conductive toy dart (22). Touchscreen device (13) computing system can then interpret touch event (15) in accordance with the display appearing at the time of the event, according to user's interface settings. Furthermore, the operating game application, measures the accuracy of toy dart impact (15), and then produces graphical and/or animated gestures, according to player's "success", as defined in user's interface settings.
FIG. 5 shows a flowchart describing the steps by which a capacitive touch-sensing device may interact with a conductive toy dart, in accordance with an embodiment of the present technology.
CLAIMS

1. An interactive apparatus for shooting soft conductive toy dart towards a capacitive touchscreen device, configured to generate a digital gesture from capacitive sensing device at the place of impact, comprising: a soft conductive toy dart made of conductive materials, a conductive tip made of soft-resilient electric conductive materials, fin made of non-electric conductive materials, dart launcher;

Soft conductive dart is configured to be thrown or "shot" when its first end, the coupled tip, is facing the target aimed to. The tip of soft conductive dart touches a capacitive touch-sensing surface at impact point, without any physical touch by user;

When conductive tip charged with electric ions touches the impact point electric ions are discharged causing short circuit on touchscreen or on conductive tip thus identifying the impact point, changes capacitive of impact point and its surrounding of at least 1 Picofarad adapted to characteristics of target touchscreen and activates different pre-programmed visual reactions on touchscreen.

2. The soft conductive toy dart of claim 1 wherein toy dart is made of conductive materials, having electrical resistance to generate a gesture from a capacitive touch surface at the place of impact;

3. The toy dart of claim 2 wherein toy dart has an elongate body portion including a first end and a second end;

4. The toy dart of claim 3 wherein body portion of toy dart is made of electric conductive materials, having electrical resistivity for operating capacitive touch sensors;

5. The toy dart of claim 4 wherein first end of toy dart is coupled physically and electrically with conductive tip made of soft-resilient electric conductive materials;

6. The conductive tip of claim 1 wherein tip is made of soft-resilient electric conductive materials consisting of particles of coal or metal or silver or carbon fibers, having the required electrical resistivity for operating a capacitive touch sensor;
7. The **conductive tip** of claim 6 wherein **tip** includes a conductive resilient wall portion, consisting of preferred surface resistivity of $10^5$ Ohm/sq and above, required for operating the capacitive touch sensors;

8. The **conductive tip** of claim 7 wherein **conductive tip** is configured to be coupled with the first end, includes a resilient wall portion used as a contact surface with the capacitive touchscreen device;

9. The **conductive tip** of claim 8 wherein **conductive tip** includes a vacuum cup portion used as a contact surface with the capacitive touchscreen device;

10. The **conductive tip** of claims 6-9 wherein **conductive tip** is formed in shape of a convex disk in a preferred diameter size of 2mm and more, able to be detected by touch sensors at place of impact;

11. The second end of soft conductive toy dart of claim 5 is coupled with fins made of conductive materials or none-conductive materials;
FIG. 5

17. Player “shoot” and/or throw the soft conductive toy dart at a capacitive touch surface.

18. Direct impact of the tip of the soft conductive toy dart at the touchscreen surface.

19. Detect the touch event at the place and time of impact by the capacitive touch sensors.

20. Generate a digital gesture at the place of impact by the touchscreen device.

21. Measure player’s accuracy by user interface.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC (2014.01) F41J 3/00, A63F 9/02, A63B 65/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC (2014.01) F41J 3/00, A63F 9/02, A63B 65/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases consulted: THOMSON INNOVATION, Esp@cenet, Google Patents, FanPat database

Search terms used: dart, ball, arrow, projectile, dagger, touchscreen, tablet, smartphone, game, toy

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C. See patent family annex.

Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"X" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Z" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search 20 Jul 2014

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