IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Utility Patent Application (Provisional)

TITLE: FOLDING INSTRUMENT COMPRISING OF MULTIPLE MINIATURIZED GEOMETRICAL DRAWING TOOLS

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FIELD OF THE INVENTION

[0001] The present invention relates to the collection of drawing tools, i.e., rulers, the compass, protractor, set-squares, shape tracing apparatus, and divider, in one device which folds in half. More particularly, the invention relates to a folding device comprising geometrical drawing tools that have been made smaller.

BACKGROUND

[0002] Geometrical drawing tools are used to draw geometrical figures and are used in mathematics and sciences. Everyone uses them because they draw accurate geometrical figures.

[0003] Geometrical drawing tools have been in use for centuries. They have not changed over the years. There is a need to change geometrical tools to par with the standards of the 21st century.

[0004] These tools are bulky and take up too much space. They cannot fit in a small amount of space and usually need a bag or box to fit them in. The tools are inefficient since one must carry a lot of tools to draw simple objects. Often, the tools are put in a small enclosed space like a box or a bag and go unused, rendering them useless.

[0005] Even if one tool gets broken or goes missing, the complete set of geometrical tools renders it useless. You could construct the figure, but it would take much longer and not as accurate. Having all the tools at once is essential for you to draw.

[0006] Geometrical drawing tools are not made of high-quality materials but made with thin metals or flimsy plastics, which can bend easily and break and shrink due to heat, giving improper results.

[0007] According to a research paper, A Hendroanto and H Fitriyani 2019 J. Phys.: Conf. Ser. 1188 012051, students and teachers often struggled to use tools in class. The results of the research paper showed 44.83% of teachers

struggled to use the tools in class. 86.21% of teachers agreed the tools need to be developed into more efficient ones. 46.6% of the students struggled with the tools, and 86.67% wanted the tools to be more efficient. The consensus of this paper showed that the test subjects needed a better geometrical that includes all the geometrical drawing tools in one device. 93.34% of the test subjects said they would appreciate it if there was a more practical geometrical drawing tool.

[0008] Therefore, a need exists for a better and more efficient device for geometrical drawing tools. There is a need to create a device that uses high-quality materials. Finally, there is a need to integrate all the tools into one device to save space and let users use all the tools at once without carrying them in a big bag or box.

BRIEF SUMMARY OF THE INVENTION

[0009] The present invention comprises six geometrical drawing tools into one device. Set squares, protractors, compasses, shape tracing apparatus, rulers, and a divider are the geometrical drawing tools on this device. The tools are made to fit on two credit card-sized structures and are held together with a flexible thin material that allows the device to fold in half. The tools on this device have been made into a more miniaturized version than the geometrical drawing tools you find in the market. The compass works on a sliding mechanism. The set squares have been combined into one, which gives a structure where only the necessary angles are needed. The protractor in this device allows the user to find out and draw up to 270 degrees. The rulers have not changed much, but this device has empirical and metric measurements. The shape drawing apparatus allows users to draw out shapes quickly. The divider in this device acts as a caliper and divider at the same time. All the geometrical tools have been designed and re-engineered to save on space and fit in one structure. This structure (the present invention) can fit in a pencil case or a wallet. In simple terms, the present invention is a device that has miniaturized versions of geometrical drawing tools embedded in it.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Some embodiments of the present invention are illustrated as an example and are not limited by the figures of the accompanying drawings, in which like references may indicate similar elements and in which:

[0011] FIG. **1** - Figure **1** depicts a front view perspective of the present invention according to various embodiments of the present invention.

[0012] FIG. **2** - Figure **2** depicts a back view perspective of the present invention according to various embodiments of the present invention.
[0013] FIG. **3** - Figure **3** depicts a top-side view of the present invention according to various embodiments of the present invention.
[0014] FIG. **4** - Figure **4** depicts a front view of the parts prominent in the present invention according to various embodiments.
[0015] FIG. **5** - Figure **5** illustrates a front view perspective of the present invention when deconstructed and with all the parts clearly shown according to various embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The terminology used herein is to describe particular embodiments only and is not intended to be limiting of the invention. As used herein, the term "and/or" includes any combinations of one or more of the associated listed items. As used herein, the singular forms "a," "an, " and "the" are intended to include the plural forms as well as the singular forms, unless the context indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, steps, operations, elements, components, and/or groups thereof.
[0017] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one having ordinary skill in the art to which this invention belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and the present disclosure and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.
[0018] In describing the invention, it will be understood that several techniques and steps are disclosed. Each of these has individual benefits and each can also be used in conjunction with one or more, or in some cases all, of the other disclosed techniques. Accordingly, for the sake of clarity, this description will refrain from repeating every possible combination of the individual steps in an unnecessary fashion. Nevertheless, the specification and claims should be read with the understanding that such combinations are entirely within the scope of the invention and the claims

[0019] The present invention is discussed herein. In the following description, for purposes of explanation, numerous specific details are outlined to provide a thorough understanding of the present invention. It will be evident, however, to one skilled in the art that the present invention may be practiced without these specific details.

[0020] The present disclosure is to be considered as an exemplification of the invention and is not intended to limit the invention to the specific embodiments illustrated by the figures or description below.

[0021] The present invention will now be described by referencing the appended figures representing preferred embodiments. FIG. 1 depicts an image of the front view perspective of the present invention fully assembled and whole. FIG. 1 shows Part 18, the complete right side of the present invention. Part 18 is a card-like structure consisting of various parts cut out from it and the part protruding. Part 18 compromises parts 1 to 5.

[0022] Part 2 is on the right side of Part 18. The whole length of the right side has a bevel. Part 1 is on top of Part 2; it has measurements depicted on Part 2 in centimeters. Parts 1 and 2 make up the scale portion of the present invention.

[0023] Part 4 is a cutout in Part 18. The cutout is in the form of 2 concentric circles, varying in a radius of a few millimeters, with the only ¾ of its diameter being present and on the ends which is closer to Part 2, a straight line of the length of the radius of the smaller circle protrudes out. Part 3 is on top of part 4; it has the measurements depicted in degrees (0 to 270). Parts 3 and 4 compromise the protractor portion of the present invention.

[0024] Part 5 is a cutout in part 18. Part 5 consists of a straight line with four extra lines protruding out from it. These lines protrude out in specific angles: 30, 90, 60, 45, and 180. Part 5 compromises the set-square portion of the present invention.

[0025] Part 19 compromises the left side of the present invention. It is a card-like structure consisting of various cutouts and parts. Part 19 comprises Parts 7 to 12.

[0026] Part 6 is a flexible part that can fold. Part 6 connects the right side and the left side of the present invention. Part 6 connects Part 18 and Part 19 with itself in the middle. It also acts as a hinge allowing the present invention to fold in half.

[0027] Part 7 is a cutout in Part 19; it is a cutout of the letter X. Part 8 is next to Part 7, a cutout in Part 19; it is a triangle cutout in Part 19. Part 9 is a cutout of

a square in Part 19. Part 10 is a cutout of a circle in Part 19. Parts 7 to 10 consist of the shape drawing apparatus portion in the present invention.

[0028] Part 11 is a pinhole-sized cutout in Part 19. Part 13 is a slim rectangular cutout in Part 19 and is below Part 11. Part 14 fits in Part 13 and can move/slide down and up (2 directions only) in Part 13. To the right of Part 13 and along its length lies Part 12; Part 12 depicts an illustration on Part 19 of measurements in centimeters. Parts 11 to 14 consists of the compass portion in the present invention.

[0029] Part 15 is a rectangular piece cut out from Part 19. It is ⅓ of the width of Part 19. There is some material cut out from the length of the left side of Part 19. So the material is also removed to the right of Part 15. Part 16 is a house-shaped piece that fits on Part 15 and can move/slide down and up Part 15. Part 17 is identical to Part 16 and performs the same functions. Along the length of Part 15 is an illustration of measurements in millimeters drawn on Part 19. Parts 15, 16, and 17 compromise the divider/caliper portion of the present invention.

[0030] Referring to FIG. 2, in some embodiments, shows the back-side view of the present invention. The back is very similar to the front of the present invention, but there are a few changes. The set-squares angles are in reverse, and the illustrations around the square are in the opposite order. The shape drawing apparatus is in the opposite order. The compass is now the opposite way. The protractor's orientation has been flipped and can't be used on the back of the present invention. However, the divider/calipers look the same on the front and back sides of the present invention. Part 46 of FIG. 2 shows an illustration of measurements drawn out in inches on the right edge of the present invention.

[0031] Referring to FIG. 3, in some embodiments, shows the top view perspective of the present invention. 20 shows the present invention fully extended and 21 shows the present invention partially closed. As mentioned, the present invention has two parts/halves and can be opened and closed due to Part 6 (From FIG. 1), a hinge.

[0032] FIG. 4 shows a closeup of all the parts present in the current invention. All these parts have been re-engineered to be higher functioning and smaller. 23 depicts a close-up image of the dividers/calipers portion of the present invention. 24 depicts a close-up image of the protractor present. 25 shows a closeup view of the “merged set-squares” portion of the present invention. 26 shows a close-up view of the shape drawing apparatus portion of the present invention. 27 shows a closeup view of the scale in centimeters on the

present invention, and 28 shows a closeup view hinges on the present invention. All the parts of the present invention may be made with plastic, metal, hard rubber, or other similar material.

[0033] In further embodiments, FIG. 5 shows a deconstructed illustration of the present invention. Some parts are not labeled in this figure because they have already been specified in the content written above. This perspective provides a top view and has arrows pointing to how the present is assembled.

[0034] Parts 29, 37, 43 make up the left side/half of the invention; when combined, they make up Part 19 from FIG. 1. Parts 30, 38, 44 make up the right side/half of the invention; when combined, they make up Part 18 from FIG. 1.

[0035] Parts 33 to 36 and Parts 39 to 42 are identical and perform identical functions. These parts are assembled in a specific way, Parts 35 and 33 are attached to part 36, according to the arrows. There will be a space between them. This space has enough width for another part to fit in it. In this case, Part 15 from FIG. 1 or where the arrow is pointing from 33. Part 37 and Part 29&43 are not the same; parts 29 and 43 are identical, but part 37 has a slim rectangular strip of material on its leftmost side. This part allows 33 to 36 and 39 to 42 to be attached to the present invention via Part 15. Part 33 to 35 is attached to the rectangular piece freely with the top attached, Part 34. Part 33 to 36 can move on 15 along its whole length. It has been specified that Parts 33 to 36 and Parts 39 to 42 are identical. Parts 39 to 42 also are assembled the same way. They are attached to Part 15 and can easily be moved up and down on Part 15. This is how the divider/caliper is assembled in the present invention.

[0036] Parts 29 and 43 may look identical in FIG. 5, but the part in the middle, Part 37, is different from them. The slim rectangular cutout in the middle of Part 29 and 43 is wider in Part 37. This wider rectangular cutout is Part 45. Part 45 is a wide rectangular cutout in Part 37. It has enough width for a small rectangular piece to fit and move/slide down/up in it. Part 31 is a small rectangular piece of material and it conveniently fits in cut-out 45, allowing it to move/slide up and down in 45. Once Part 31 is put in 45, Parts 29, 37, and 45 get assembled as shown in the arrows shown in FIG. 5. This assembling of pieces allows Part 31 from not falling out from the left half of the present invention, Parts 29 and 43 slim rectangular in the middle allows Part 31 to be blocked from falling but at the same time, it can be moved in 45. As mentioned before, Part 37 houses 45 of which houses Part 31. This is how the compass portion of the present invention is assembled.

[0037] Part 30 and 44 are identical, they look the same but they have a beveled edge on their rightmost side. This is for the scale and allows for more accurate readings. Their right side is beveled at a slight angle. Part 38 looks the same as Part 30 and 44 but does not have a beveled edge on its rightmost side. It is a flat part and has no modifications made to its structure. The cutouts in these parts have been identified in the descriptions above. Part 30, 44, and 38 are attached in a special way to make the right side of the present invention: Part 30 with its beveled side downward is attached to the flat Part 38 which is then attached to Part 44 with its beveled edge facing upwards. The arrows given show how the parts are attached. This is how the right side of the present invention is assembled

[0038] Part 32 is a slim flexible rectangular piece of plastic that attaches the halves of the present invention while allowing the present invention to fold in half to save on space. Part 32 attaches to Part 37 and 38 and connects them, bringing the invention together. This is shown by the arrows given in the figure. Specific steps to assemble the halves of the present invention have been given above. The assembly will go as mentioned with Part 32 attaching the halves and making all the parts get connected into the present invention. Part 32 is thin and can be folded in half horizontally allowing the halves to flex together to close up and fold in half. This function is added to the present invention to save on space and allows it to embed more geometrical tools.

[0039] All the parts in the present invention can be made with low-weight high-quality metal, plastic, or hard rubber. The parts are attached with a strong adhesive. They have also been designed in a way to match up with the other parts precisely when assembled. The parts, once assembled, can be painted but with a thin coat of paint to prevent them from getting too thick and losing their ability to function. The illustrations of the measurements on the present device should be precise to avoid confusion and should be exactly marked up next to the parts.

[0040] Although the present invention has been illustrated and described herein regarding preferred embodiments and specific examples thereof, it will be readily apparent to those of ordinary skill in the art that other embodiments and examples may perform similar functions and/or achieve similar results. All such equivalent embodiments and examples are within the spirit and scope of the present invention, are contemplated thereby, and are intended to be covered by the following claims.

CLAIMS

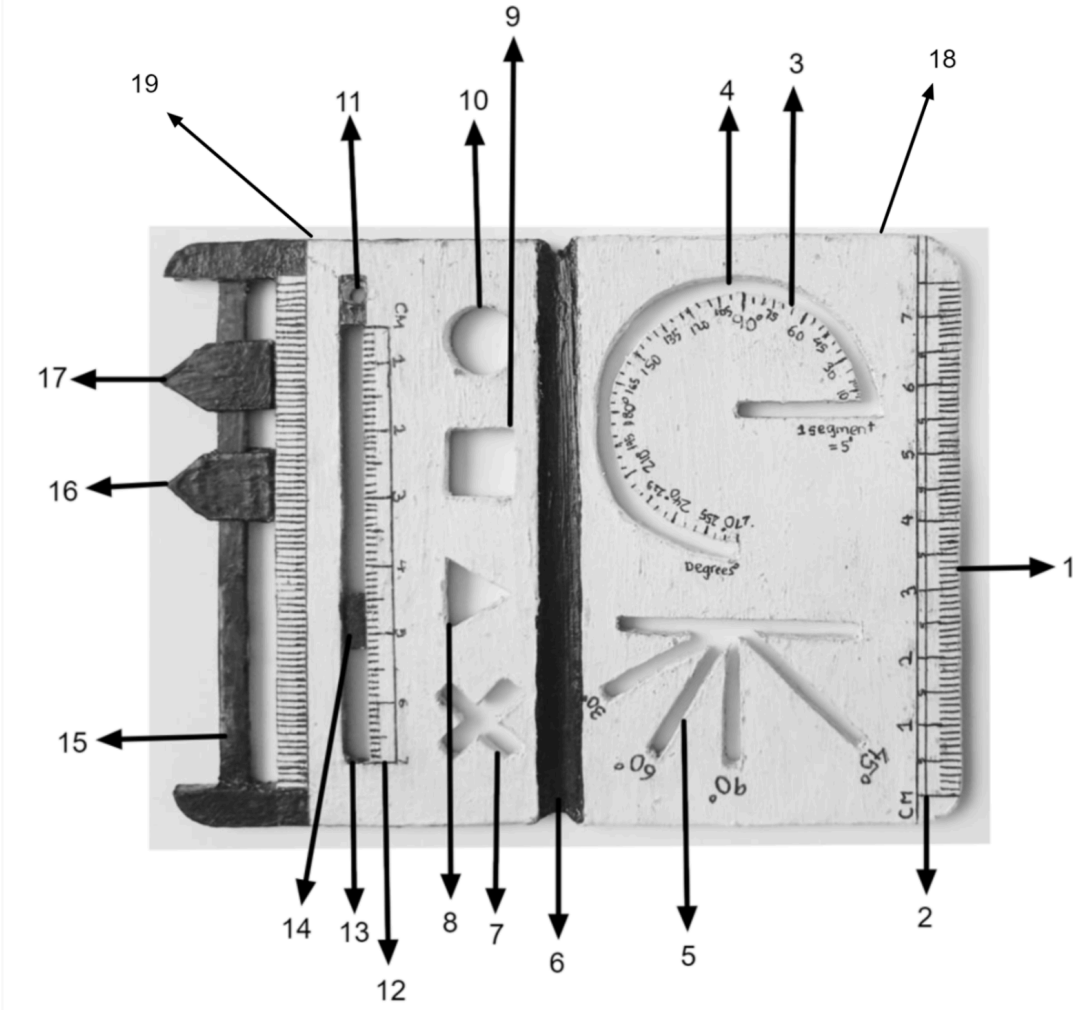
What is claimed in this application:

1. A device that comprises multiple geometrical drawing tools, allowing users to use all the tools together, and make sure they have all the tools in one place. The device makes use of cutouts, allowing users to be able to trace out geometrical figures rather than drawing them by themselves. The device is configured to make the best use of geometrical drawing tools.
2. The device also claims to save on space, taking up the space of 2 credit cards when unfolded and one credit card when folded in half. The geometrical drawing tools have been redesigned to be smaller and to fit on the small device.

ABSTRACT

The present invention is a device that folds in half and comprises multiple geometrical drawing tools embedded into it. The geometrical drawing tools include a compass, scales in centimeters and inches, a 0-270 degree protractor, a divider/caliper, shape drawing apparatus, and set-squares. The geometrical drawing tools have been redesigned to be smaller and higher functioning and have been integrated into a folding device. As mentioned, the device folds in half to take up the space of a credit card. The compass and divider/caliper have been re-designed in a way that it has become flat and easier to use. The set squares which were 2 different scales have been re-designed to take up the space of a dollar coin. The protractor has been made in such a way that it can find out construct angles from 0-270 degrees. In short, it is a small highly functioning device that contains multiple geometrical drawing tools.

DRAWINGS


19
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45°

FIG. 1

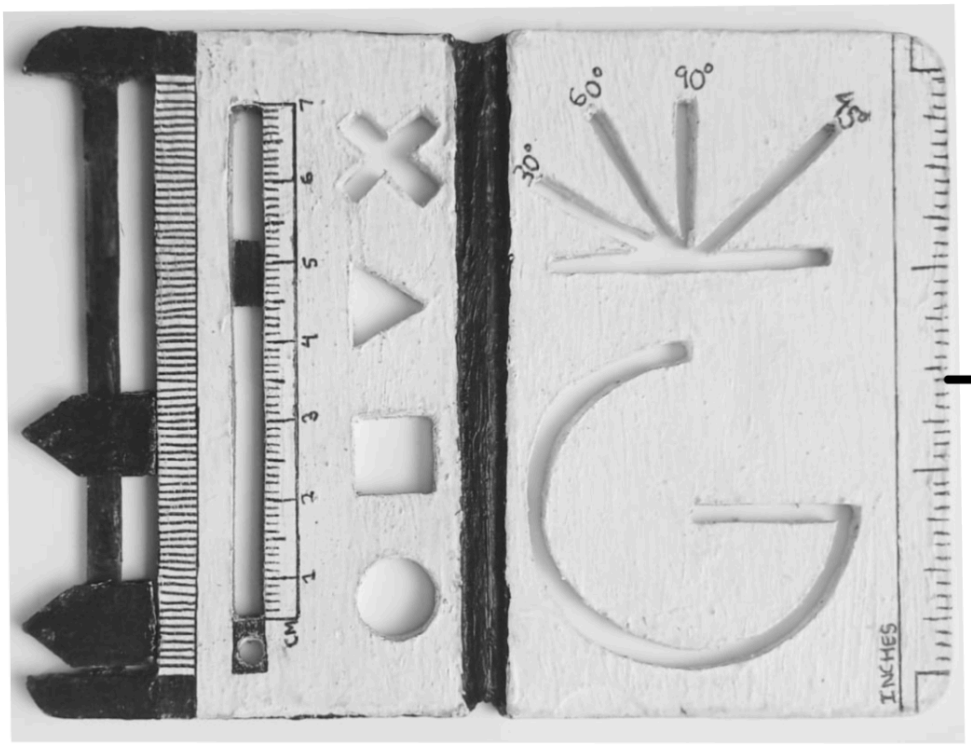

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FIG. 2

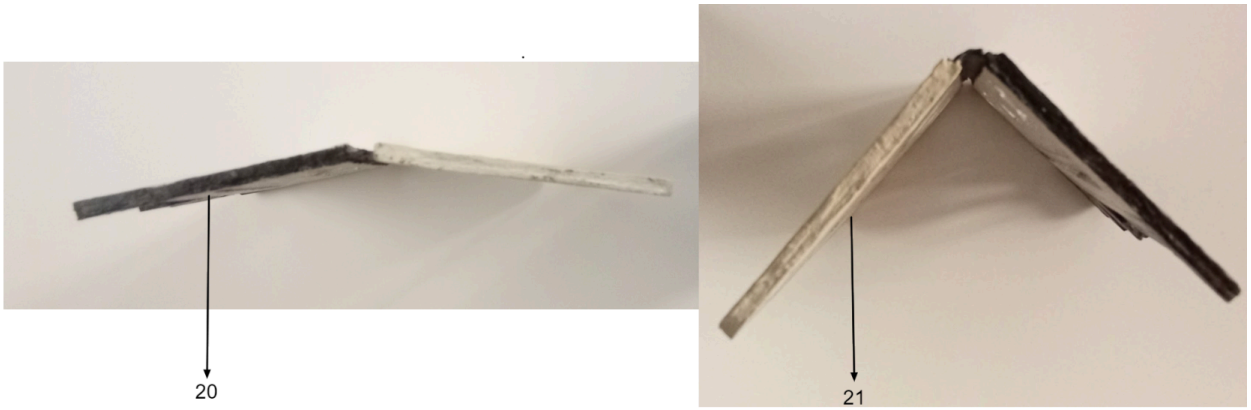

FIG. 3

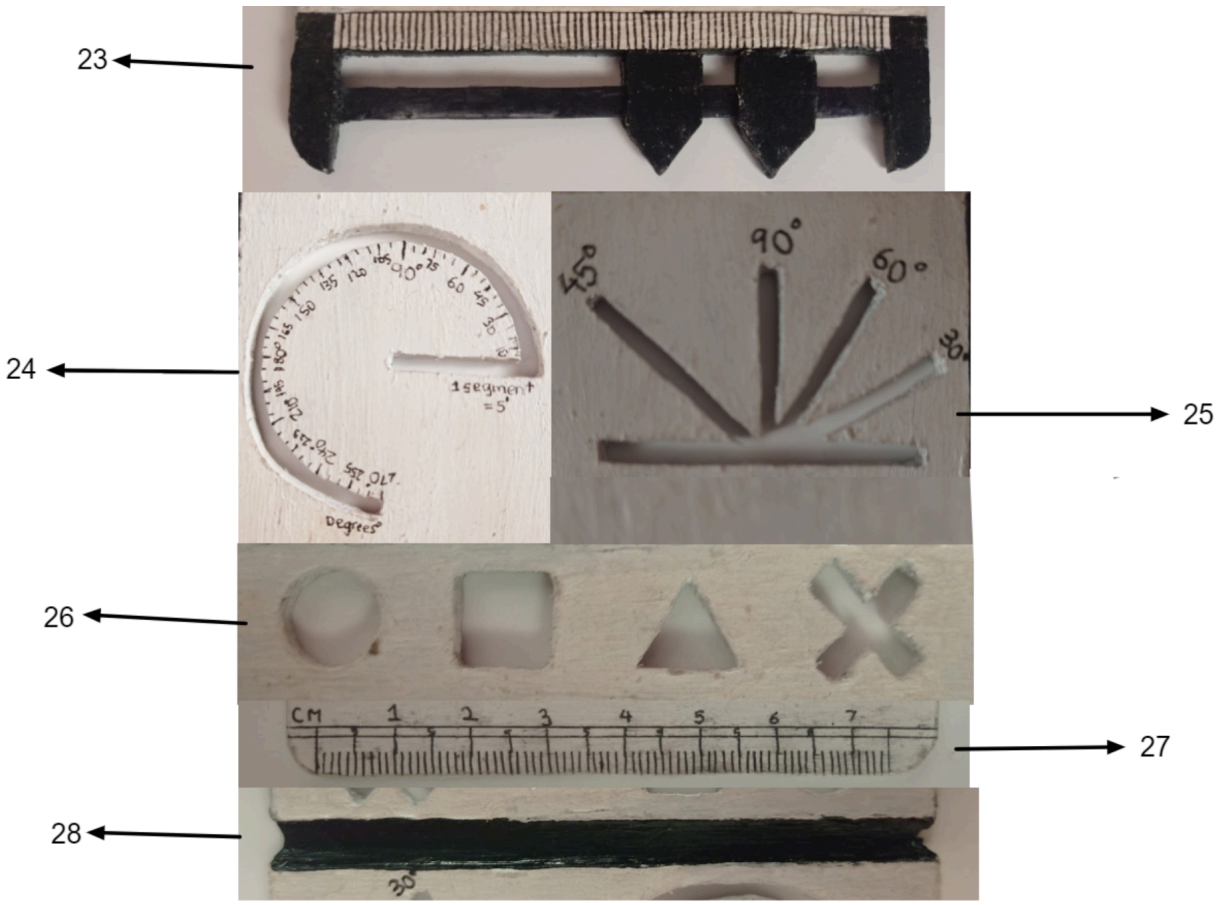

FIG. 4

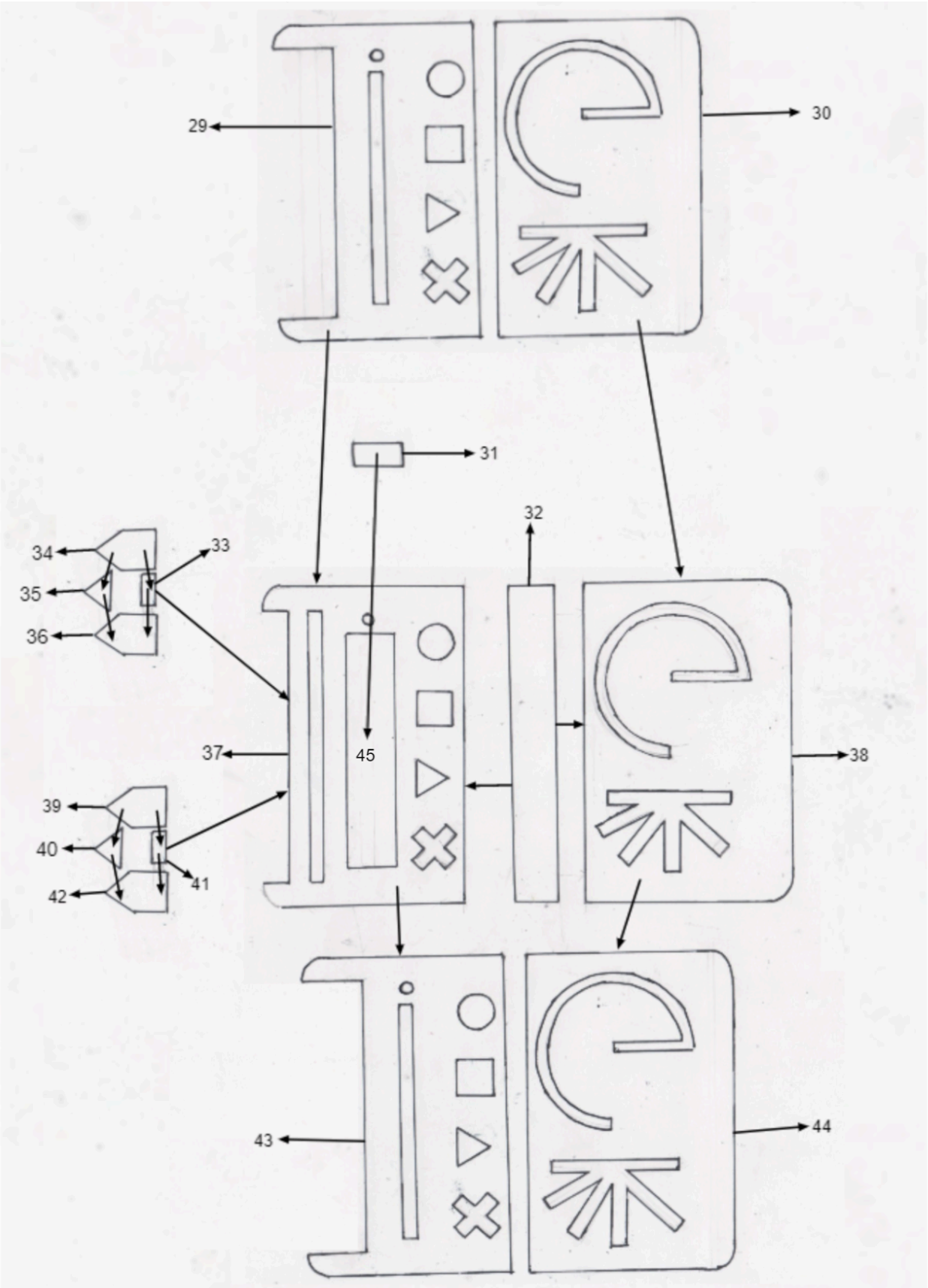

FIG. 5

eFiled Application Information

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Application Number	6[redacted]2
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Title of Invention	Folding Instrument Comprising Of Multiple Miniaturized Geometrical Drawing Tools
First Named Inventor	Asray Gopa
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Filing Date	
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Title

Folding Instrument Compromising Of Multiple Miniaturized Geometrical Drawing Tools

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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