

Moxibustion device

Technical Field

The present invention relates to a tool used in a therapy in traditional Chinese medicine (TCM), specifically a moxibustion device that can be used on human acupoints.

Background Art

Moxibustion is an integral part of acupuncture-moxibustion practice and it is an important therapeutic method used in TCM. It has a long history of several thousand years and has notable clinical importance. The therapeutic effects of moxibustion are achieved through many factors, such as by heat stimulation on the acupoints and the pharmacological effects of the chemicals released during burning of the moxa herb (*Artemisia vulgaris*). There are two traditional forms of moxibustion, namely moxibustion with moxa cone and with moxa stick. However, both forms of moxibustion generate excessive smoke and pollute the environment; hence they are not within the acceptance limits of patients and doctors. There is also the danger of scalding patients by burning ashes that may drop during the treatment. Besides that, a large proportion of moxa wool is wasted and the temperature is not constant during the process, consequently affecting treatment efficacy. The operations therein are also inconvenient. All these factors greatly limit the use of moxibustion. This led to the emergence of 'smokeless' moxibustion and moxibustion boxes. The most common form of 'smokeless' moxibustion nowadays is a 'smokeless' moxa stick comprised of carbonized moxa compound and charcoal at a fixed ratio. 'Smokeless' moxibustion generates less smoke and is more convenient. However, it has the following disadvantages:

Firstly, the material is made up of carbonized moxa compound and charcoal at a fixed ratio, which is different from the moxa wool used in traditional moxibustion. It is possible to use different materials during moxibustion; however it would lead to different therapeutic effects. This difference has already been noted by TCM doctors thousands of years ago and it is also believed that moxa wool produces the greatest therapeutic effect, which other substitutes cannot achieve. This is the reason why moxa wool is used in moxibustion, giving rise to its Chinese name of *ai jiu means combustion with moxa wool*. Therefore, moxa wool must be used in moxibustion and other methods that use substitute materials should not fall under the same category. There is a change in nature when different materials are used, whether it is a mixture of carbonized moxa compound and charcoal or simply a carbonized moxa compound. Such substitutes burn at a higher temperature and the burning head of the stick breaks and falls apart easily during the process, causing burn injuries. Due to these differences in nature and principles, they are fundamentally distinct from traditional moxibustion using moxa wool. In addition, the therapeutic effect of traditional moxibustion is due to a combination of various factors, including the medicinal properties of moxa wool and the radiation emitted during combustion, thus it is not merely just a heating effect. Many 'smokeless' moxibustion in the market nowadays only have a heating effect and are unable to achieve the same efficacy as that of traditional moxibustion.

Secondly, the unconstant temperature during the moxibustion process makes it difficult to attain a distribution of channel sensation, which is kind of warm or sore feeling distributing along the

channel when receiving moxibustion or acupuncture, thereby lowering efficacy. It also causes scalding, blisters and infections more easily. Although blisters can arise from moxibustion treatment of particular diseases, it is difficult for widespread usage of this method as it is considered unacceptable by many people nowadays. There is also large wastage due to ineffective combustion.

Although moxibustion boxes available in the market can control the speed and temperature of the burning process to a certain extent, there is still a limit to the degree of adjustment. Furthermore, a large amount of smoke is generated, and the boxes can be turned over easily and there remains the danger of causing scalds or fire hazards by fallen ashes.

Disclosure of the Invention

One of the aims of the present invention is to provide a moxibustion device that has a high moxibustion distribution effect.

Another aim of the present invention is to provide a moxibustion device that emits little smoke and is environmental friendly.

Another aim of the present invention is to provide a moxibustion device that has a long moxibustion duration, adjustable temperature, good efficacy, safe, convenient to use and is disposable.

To achieve the above, the present invention provides a moxibustion device that has the characteristics of a moxibustion cylinder with a moxibustion cap at the top, moxa roll, moxa roll holder and a temperature regulator. The moxa roll is placed on its holder, which is connected below the temperature regulator in the moxibustion cylinder. The temperature regulator protrudes above the moxibustion cylinder from the centre of the moxibustion cap. By adjusting the length of the regulator that protrudes from the top, the distance of the holder from the base of the cylinder is adjusted. There are a few air inlets at the bottom of the cylindrical wall and air outlets at the top. The ratio of the total surface area of the air inlet to the surface area of the moxibustion cylinder is 1-10:100.

The present invention is a moxibustion device that is environmental friendly, almost smoke-free, has long moxibustion duration, allows temperature adjustment, good efficacy, safe and convenient to use.

Preferably, the ratio of the total surface area of the air inlets to the air outlets openings is 0.5-2. The ratio of the total surface area of the air inlet to the surface area of the moxibustion cylinder is 3:100.

The moxa roll mentioned refers to Chinese mugwort leaf or a cylindrical moxa roll made from processed moxa wool with 3-5 types of dimensions depending on its usage.

Preferably, the temperature regulator is composed of an adjustable bolt and a moxibustion cap nut, connected using screw threads. The moxa roll holder is joined to the adjustable bolt using connecting pins.

Preferably, the temperature regulator can also be composed of a position-limiting spring, position-limiting pellet, position-limiting rod and a sealing ring. The rod has 2-5 fixed positions and the height of the moxa roll holder is adjusted by its position on the rod. The limiting force of the pellet can be modified using screws. The sealing ring prevents smoke from leaking out through the rod. The temperature regulator adjusts the distance of the moxa roll from the skin, thus achieving the aim of temperature adjustment. This prevents burn injuries from happening and greatly increases the occurrence of channel sensation distribution of moxibustion, thereby increasing efficacy.

Preferably, the base of the moxibustion cylinder is a heat transmission layer. The moxa roll is over the base of the cylinder and keeps a certain distance to it. The heat transmission layer has numerous small holes that allow heat to travel to the acupoints after the moxa roll is ignited. The bottom of the moxibustion cylinder is a seater in the shape of a hollow ring, which can be affixed on specific acupoints using double-sided adhesive that is environmental friendly. There is a moxibustion film that is packaged separately and sealed for indirect moxibustion. Each film has a thin membrane impregnated with extracts from medicinal herbs such as *fu zi* (*Aconitum carmichaeli*), *she xiang* (*Moschus moschiferus*), *san qi* (*Panax pseudoginseng*) or *dan shen* (*Salvia miltiorrhiza*). The film is chosen according to the disease and is inserted in the hollow area at the bottom. The thickness of the film is around 1-2mm and allows air ventilation and heat diffusion. In traditional moxibustion therapy, indirect moxibustion is performed by placing the moxa wool on top of a slice of ginger. However the thickness of the ginger and differences among human skin often cause scalding, blisters and infection. This film achieves the effects of indirect moxibustion and also solves the problems of scalding, blisters and infection.

Preferably, the above-mentioned heat dissipation layer has an ignition component. This invention can be selectively ignited using electricity. The ignition component is made up of an electric plug (electrodes), non-flammable wire and an electric spark appliance. The electric spark appliance is above the heat dissipation layer and closes to the base of the moxa roll (or affixed to the base of the moxa roll holder). The electric plug (electrodes) protrude(s) from the side of the cylindrical wall. When the power supply is turned on, the electric spark will ignite the moxa roll. To facilitate the ignition process, the moxa roll can be pasted with a piece of wax paper. The power supply is then cut off and the moxibustion device is secured on the acupoints through the use of double-sided adhesive that is environmental friendly and non-irritating at its bottom. The mentioned plug (electrodes) can also be located at the top of the moxibustion cap.

Preferably, the ignition component can also constitute an electric plug (electrodes), non-flammable wire and resistance wire located at the bottom of the moxa roll holder. The electric plug (electrodes) protrude(s) from the side of the cylindrical wall. When the power supply is turned on, the moxa roll is ignited due to heat from the resistance wire. To facilitate the ignition process, the moxa roll can be pasted with a piece of wax paper. The power supply is then cut off and the moxibustion device is secured on the acupoints through the use of double-sided adhesive that is environmental friendly and non-irritating at its bottom. The above-mentioned plug (electrodes) can also be located at the top of the moxibustion cap.

Preferably, the above-mentioned moxibustion cylinder is cylindrical in shape, made of cardboard material, with a non-flammable inner lining (e.g. tinfoil). The air outlet has a filtering membrane, which allows ventilation and also prevents the escape of smoke suspension particles. The use of cardboard as the material for the moxibustion cylinder makes it environmental friendly and can be

disposed after single usage. The non-flammable inner lining prevents fire hazards from occurring during the moxibustion process. The smoke filtering membrane further prevents smoke generated during the combustion from escaping into the environment. The ratio of the total surface area of air inlet to air outlet openings is 0.6-0.9 or 1.5-1.8. This ratio can be changed by adjusting the air inlet casing between the range of 0.5-2. The transverse cross-section of the above-mentioned moxibustion cylinder is circle or oval in shape.

Preferably, the above-mentioned smokeless moxibustion device has an added flammable ignition component, made from non-toxic flammable material available in the market. The front end of the component is first inserted into the moxa roll and the rear end can be pulled out from the bottom or side of the moxibustion cylinder. Open flames, such as matchsticks are used to ignite it.

Preferably, the moxa roll holder can be secured in the moxibustion cap using rivet pins. The rivet pins extend into the inside of the moxibustion cylinder and the moxa roll is inserted into the end of the rivet pins toward the inside of the cylinder.

According to another aspect of the present invention, it provides a moxibustion device with the characteristics of a moxibustion cap at the top, moxibustion cylinder, moxa roll, moxa roll holder, a temperature regulator and a moxibustion seater. The temperature regulator is in the shape of a bolt, located in the centre of the moxibustion cap. The moxibustion cap is a screw nut and the two parts are connected using screw threads. The moxa roll holder comprises of two strands of resistance wire that pass through the bolt and extend over the moxibustion seater, forming a closed loop with the two ends of the resistance wire. The two wires become the electrodes at the top of the bolt and are attached to the bolt. The moxa roll is placed between the two wires and comes into contact with the resistance wire. The moxibustion cylinder have inner and outer layers. The inner layer has an inner restricting ring with ridges at the top, while the outer layer has an outer restricting ring with grooves at the bottom. The inner layer is attached to the inner restricting ring at the bottom. The outer restricting ring is connected and attached to the upper region at the inside of the outer layer. The grooves at the bottom of the outer restricting ring fit into the ridges at the top of the inner restricting ring. The moxibustion cap is affixed to the inner layer at the top; the outer layer is secured to the moxibustion seater at the bottom. Both the inner and outer layers of the moxibustion cylinder have similar sized air outlet and inlet openings. When one of the ridges of the inner restricting ring is at either end of the grooves of the outer restricting ring, the air outlet and inlet openings are at their widest opening or closing position.

Preferably, the air inlet is located at the bottom of the cylindrical wall and the air outlet is located above. The ratio of the total surface area of the air inlet to the surface area of the moxibustion cylinder is 1-10: 100. The ratio of the total surface area of the air inlet to that of the air outlet openings is 0.5-2.

Preferably, the resistance wire forms a 'z' shape or a closed loop and supports the weight of the moxa roll.

Preferably, the bottom of the moxibustion seater is a double-sided adhesive. Both the inner and outer layers of the moxibustion cylinder have a smoke-absorption lining.

The present invention is made after repeated experiments on the existing moxa stick and it is an improvement with respect to the above-mentioned disadvantages, bringing forth an environmental friendly, convenient and smokeless moxa device, which can be affixed to acupoints during moxibustion. Not only does this invention retain the inherent characteristics of moxibustion, it also

does not produce thick smoke, maintains a constant temperature during moxibustion and the temperature can be adjusted according to the heat sensitivity of each individual. It also prevents scalding and blisters. The burning of the moxa is also satisfactorily gradual, such that the moxibustion duration and efficacy are several times better as compared to a similar-sized moxa stick. There is no wastage and it is easy to use, convenient, safe and effective. It also has the effects of indirect moxibustion. This moxibustion device can control the speed of combustion, allowing more complete combustion, which greatly lengthens the moxibustion duration. Repeated experiments were done using moxa rolls with a diameter of 18mm and length of 16mm to compare the combustion time. The combustion time was 8 minutes under normal exposed conditions and 66 minutes in the moxibustion device, which is an increase of 8.3 times.

Brief Description of the Drawings

FIG. 1 is a longitudinal cross-sectional view of the moxibustion device in the first embodiment in accordance with the present invention.

FIG. 2 is a longitudinal cross-sectional view of the moxibustion device in the second embodiment in accordance with the present invention.

FIG. 3 is a longitudinal cross-sectional view of the moxibustion device in the third embodiment in accordance with the present invention.

FIG. 4 is a longitudinal cross-sectional view of the moxibustion device in the fourth embodiment in accordance with the present invention.

FIG. 5 is a 3-D diagram in accordance with the indirect moxibustion film in the present invention, which includes adjustable bolt 1, cap nut 2, moxibustion cylinder 3, moxa roll 4, securing rod for moxa roll 5, moxa roll holder 6, air inlet casing 7, air inlet 8, electric spark appliance 9, moxibustion seater 10, heat dissipation layer 11, electric plug (electrodes) 12, non-flammable wire 13, wax paper 14, connecting pins 15, air outlet 16, filter membrane 17, moxibustion cap 18, adjusting screws 19, position-limiting spring 20, position-limiting pellet 21, position-limiting rod 22, sealing ring 23, push-pull ring 24, flammable ignition component 25, indirect moxibustion film 26 and thin membrane 27.

FIG. 6 is an exploded perspective view of the sixth embodiment of the moxibustion device in accordance with the present invention. Reference sign 3.1 refers to the inner layer of the moxibustion cylinder. Reference sign 3.2 refers to the inner restricting ring of the moxibustion cylinder. Reference sign 3.3 refers to the outer restricting ring of the moxibustion cylinder. Reference sign 3.4 refers to the outer layer of the moxibustion cylinder.

FIG. 7 is a perspective view of the parts 3.1, 3.2 and 3.3 of the moxibustion cylinder of the moxibustion device in accordance with the sixth embodiment of the present invention.

FIG. 8 is a perspective view of the assembly diagram of the parts 3.3 and 3.4 of the moxibustion cylinder in accordance with the sixth embodiment of the present invention.

FIG. 9 is a perspective view showing the fitting of the grooves 28 at the bottom of the outer restricting ring 3.3 with the ridges 29 at the top of the inner restricting ring 3.2 in accordance with the sixth embodiment of the present invention.

Description of the Preferred Embodiment

Embodiment 1

The moxibustion device is made up of a moxibustion cap, moxibustion cylinder, moxa roll, temperature regulator, moxibustion seater and ignition component. Its composition principle is illustrated in FIG. 1

The adjustable bolt 1 and cap nut 2 are made from light, heat-durable resin material, connected by using screw threads. Moxibustion cylinder 3 and moxibustion cap 2 are affixed to each other using adhesive that is heat-durable and environmental friendly. Moxibustion cylinder 3 is made from cardboard material with a non-flammable inner lining and the heat dissipation pad 11 is made from aluminized paper pasted at the bottom. Moxibustion seater 10 is made from compressed Dutch board with thickness around 2mm. Moxibustion seater 10, heat dissipation pad 11 and moxibustion cylinder 3 are joined by using adhesive that is heat-durable and environmental friendly.

Moxa roll holder is composed of a moxa roll securing rod 5 and netted tray 6. Moxa roll 4 is secured on the netted tray 6 through the securing rod 5. Moxa roll 4 is the processed product of a segment of moxa stick. There are 3-5 types of dimensions depending on the usage. The netted tray 6 is made of non-flammable material, wrapped with combustible wax paper 14 on the outside. The moxa roll securing rod 5 connects with the adjustable bolt 1 through the connecting pins 15. By twisting the adjustable bolt 1, it varies the position of the moxa roll 4 inside the moxibustion cylinder 3, which adjusts the distance between the burning moxa roll and moxibustion seater. This fulfils the aim of regulating the temperature at the base of the moxibustion seater.

The air inlet 8 is located at the lower region of the wall of the moxibustion cylinder 3. There can be one or numerous air inlet 8. The exterior of the air inlet is an adjustable air inlet casing 7, which has openings that meet those of the air inlet 8. The air inlet casing 7 can be turned to vary the coverage of the air inlet 8, which regulates the amount of air inflow, thereby achieving the aim of controlling the burning rate of the moxa roll 4.

The air outlet 16 is located at the top of the cylindrical wall. There is a smoke-filtering membrane 17 pasted across the opening. The ratio of the total surface area of the air inlets and that of the air outlet openings can vary within the range of 0.5-2 by adjusting the air inlet casing 7.

The ignition component is composed of an electric plug (electrodes) 12, non-flammable wire 13, electric spark appliance 9. When the air inlet casing 7 is turned, the electric plug (electrodes) 12 is exposed. After the electric supply is switched on, the electric spark appliance 9 ignites the wax paper 14 that is wrapped outside the netted tray 6, consequently igniting the moxa roll 4. The power supply is then cut off. The moxibustion device is secured on the acupoints through the use of double-sided adhesive that is environmental friendly and non-irritating at the bottom of the moxibustion seater 10.

An indirect moxibustion film 26 that is packaged separately can be placed at the hollow space in the middle of the moxibustion seater 10. The thin membrane 27 at the center of the indirect moxibustion plate is impregnated with extracts from medicinal herbs such as *fu zi* (*Aconitum carmichaeli*), *she xiang* (*Moschus moschiferus*), *san qi* (*Panax pseudoginseng*) or *dan shen* (*Salvia miltiorrhiza*). The plate is packaged and sealed separately. The thin membrane has a thickness of around 1mm and allows air ventilation and heat dissipation.

Embodiment 2

FIG. 2 is a moxibustion device that can be ignited by electricity with a position-limiting rod to regulate temperature. Temperature adjustment is realized by adjusting the push-pull ring 24, which adjusts the height of the moxa roll 4 in the moxibustion cylinder 3. The location of the moxa roll 4 in the moxibustion cylinder 3 is fixed by means of the moxibustion cap 18, position-limiting spring 20, position-limiting pellet 21 and position-limiting rod 22. There are 3-4 fixed positions on the limiting rod 22, which allows the position of the moxa roll 4 to be adjusted. The limiting force of the limiting pellet 21 can be modified using the adjusting screws 19. The sealing ring 23 that prevents moxibustion smoke from escaping extends out from the limiting rod.

Embodiment 3

The moxibustion device is made up of a moxibustion cap, moxibustion cylinder, moxa cone, moxa cone holder, temperature regulator, moxibustion seater and ignition component, as shown in FIG. 3.

The adjustable bolt 1 and cap nut 2 are made from light, heat-durable resin material, connected using screw threads. Moxibustion cylinder 3 and moxibustion cap 2 are affixed to each other using adhesive that is heat-durable and environmental friendly. Moxibustion cylinder 3 is made from cardboard material with a non-flammable inner lining and the heat dissipation pad 11 is made from aluminized paper pasted at the bottom. Moxibustion seater 10 is made from compressed Dutch board with thickness around 2mm. Moxibustion seater 10, heat dissipation pad 11 and moxibustion cylinder 3 are joined by using adhesive that is heat-durable and environmental friendly.

Moxa roll holder is composed of a moxa roll securing rod 5 and netted tray 6. Moxa roll 4 is secured on the netted tray 6 through the securing rod 5. Moxa roll 4 is the processed product of a segment of moxa stick. There are 3-5 types of dimensions depending on the usage. The netted tray 6 is made from non-flammable material, wrapped with combustible wax paper 14 on the outside. The moxa roll securing rod 5 connects with the adjustable bolt 1 through the connecting pins 15. By twisting the adjustable bolt 1, it varies the position of the moxa roll 4 inside the moxibustion cylinder 3, which adjusts the distance between the burning moxa roll and moxibustion seater. This fulfils the aim of regulating the temperature at the base of the moxibustion seater.

The air inlet 8 is located at the lower region of the wall of the moxibustion cylinder 3. There can be one or numerous air inlet 8. The exterior of the air inlet is an adjustable air inlet casing 7, which has openings that meet those of the air inlet 8. The air inlet casing 7 can be turned to vary the coverage of the air inlet 8, which regulates the amount of air inflow, thereby achieving the aim of controlling the burning rate of the moxa roll 4.

The air outlet 16 is located at the top of the cylindrical wall, with a smoke filtering membrane 17 over it. The ratio of the total surface area of the air inlets to that of the air outlet openings can be adjusted using the air inlet casing 7 within the range of 0.5-2.

The ignition component is a flammable ignition component, made from non-toxic flammable material available in the market. The front end of the component is first inserted into the moxa roll and the rear end can be pulled out from the openings at the bottom of the moxibustion cylinder. The bottom end of the moxa roll is wrapped with combustible wax material 14 or other combustible material on the outside. Open flames, such as matchsticks are used to ignite the moxa roll. The moxibustion device is adhered to human acupoints by using double-sided adhesive that is non-irritating and environmental friendly at the bottom of the moxibustion seater 10.

An indirect moxibustion film 26 that is packaged separately can be placed at the hollow space in the middle of the moxibustion seater 10. The thin membrane 27 at the center of the indirect moxibustion film is impregnated with extracts from medicinal herbs such as *fu zi* (*Aconitum carmichaeli*), *she xiang* (*Moschus moschiferus*), *san qi* (*Panax pseudoginseng*) or *dan shen* (*Salvia miltiorrhiza*). The film is packaged and sealed separately. The thin membrane has a thickness of around 1mm and allows air ventilation and heat dissipation.

Embodiment 4

FIG. 4 is a moxibustion device that can be ignited by electricity with a position-limiting rod to regulate temperature. Temperature adjustment is realized by adjusting the push-pull ring 24, which adjusts the height of the moxa roll 4 in the moxibustion cylinder 3. The location of the moxa roll 4 in the moxibustion cylinder 3 is fixed by means of the moxibustion cap 18, position-limiting spring 20, position-limiting pellet 21 and position-limiting rod 22. There are 3-4 fixed positions on the limiting rod 22, which allows the position of the moxa roll 4 to be adjusted. The limiting force of the limiting pellet 21 can be modified by the adjusting screws 19. The sealing ring 23 that prevents moxibustion smoke from escaping extends out from the limiting rod. Moxibustion cylinder 3 and moxibustion cap 2 are affixed to each other using adhesive that is heat-durable and environmental friendly. Moxibustion cylinder 3 is made from cardboard material with a non-flammable inner lining and the heat dissipation pad 11 is made from aluminized paper pasted at the bottom. Moxibustion seater 10 is made from compressed Dutch board with thickness around 2mm. Moxibustion seater 10, heat dissipation pad 11 and moxibustion cylinder 3 are joined by using adhesive that is heat-durable and environmental friendly.

Moxa roll holder is composed of a moxa roll securing rod 5 and netted tray 6. Moxa roll 4 is secured on the netted tray 6 through the securing rod 5. Moxa roll 4 is the processed product of a segment of moxa stick. There are 3-5 types of dimensions depending on the usage. The netted tray 6 is made from non-flammable material, wrapped with combustible wax paper 14 on the outside. The moxa roll securing rod 5 connects with the adjustable bolt 1 through the connecting pins 5. By twisting the adjustable bolt 1, it varies the position of the moxa roll 4 inside the moxibustion cylinder 3, which adjusts the distance during the burning moxa roll and moxibustion seater. This fulfils the aim of regulating the temperature at the base of the moxibustion seater.

The air inlet 8 is located at the lower region of the wall of the moxibustion cylinder 3. There can be one or numerous air inlet 8. The exterior of the air inlet is an adjustable air inlet casing 7, which has openings that meet those of the air inlet 8. The air inlet casing 7 can be turned to vary the coverage of the air inlet 8, which regulates the amount of air inflow, thereby achieving the aim of controlling the burning rate of the moxa roll 4.

The air outlet 16 is located at the top of the cylindrical wall, with a smoke filtering membrane 17 over it. The ratio of the total surface area of the air inlets to that of the air outlet openings can be adjusted by using the air inlet casing 7 within the range of 0.5-2.

The ignition component is a flammable ignition component, made from non-toxic flammable material available in the market. The front end of the component is first inserted into the moxa roll and the rear end can be pulled out from the openings at the bottom of the moxibustion cylinder. The bottom end of the moxa roll is wrapped with combustible wax material 14 or other combustible material on the outside. Open flames, such as matchsticks are used to ignite the moxa roll. The moxibustion device is adhered to human acupoints by using double-sided adhesive that is non-

irritating and environmental friendly at the bottom of the moxibustion seater 10. The moxibustion film has a thin membrane impregnated with extracts from medicinal herbs such as *fu zi* (*Aconitum carmichaeli*), *she xiang* (*Moschus moschiferus*), *san qi* (*Panax pseudoginseng*) or *dan shen* (*Salvia miltiorrhiza*).

Embodiment 5 explains results of two experiments comparing the distribution effects of moxibustion using two different moxibustion methods.

40 healthy individuals were randomly separated into two groups, A and B, with 10 males and 10 females in each group. The youngest and oldest age in group A was 25 and 37 respectively, with an average age of 28.35 years old. The youngest and oldest age in group B was 25 and 38 respectively, with an average age of 27.83 years old. The method used for group A was the traditional warming moxibustion method using moxa stick, that is, mild-warming suspended moxibustion, while 'smokeless' moxibustion device was used for group B using embodiment 1 of the present invention.

Method: Moxa stick used was the premium moxa stick produced from *Nan Yang Han Yi Ai Rong Chang*, with dimensions 18mm*200mm. The moxa roll used in the 'smokeless' moxibustion device came from the same batch of moxa stick, cut into segments that were 10mm long, with dimensions 18mm*10mm. Acupoint used: *zu san li* (ST 36) on the right side. The subjects were instructed to observe their reaction to the moxibustion treatment, but were not informed of the moxibustion method used. Gentle moxibustion stimulation was used for both groups and their reaction during the moxibustion process was recorded by enquiring the subjects if they experienced any feelings of heat or soreness being distributed upwards or downwards for a distance that exceeded around 20cm, besides experiencing the warming effect

Recording method for moxibustion distribution effect: By enquiring the reaction of the subjects after receiving moxibustion treatment for 5mins (equivalent to burning around 10mm of moxa stick), 15mins, 30mins and 45mins (the ending of the 'smokeless' moxibustion device).

The results showed that: at the 5 min interval, both groups did not show any distribution effect. At the 15 min interval, 2 subjects in group A and 4 subjects in group B experienced distribution effect. At the 30 min interval, 6 subjects in group A and 10 subjects in group B experienced distribution effect. At the 45 min interval, 8 subjects in group A and 13 subjects in group B experienced distribution effect. Based on the comparison of burning moxa cone for around 10mm, mild-warming suspended moxibustion lasted for 5 mins, with 0 subjects experiencing any distribution effect, while moxibustion lasted around 45 mins when the 'smokeless' moxibustion device was used, with 13 subjects experiencing distribution effect.

The table below shows the occurrence of the moxibustion distribution effect in the 2 groups

Group	5min	15min	30min	45min
	No. of people (% of occurrence)	No. of people (% of occurrence)	No. of people (% of occurrence)	No. of people (% of occurrence)
A (n=20)	0(0%)	2(10%)	6(30%)	8(40%)
B (n=20)	0(0%)	4(2%)	10(50%)	13(65%)
P value	>0.05	<0.05	<0.01	<0.001

The table below shows the comparison of moxibustion time and occurrence of distribution effect based on the burning of 10 mm of moxa roll:

Moxibustion method	Time (min)	Occurrence of distribution effect	Emission of smoke	Method of administration
Traditional mild-warming moxibustion	5	0	Thick smoke	Requires a professional to perform the moxibustion
‘Smokeless’ moxibustion device	45	13	Almost no smoke	Does not require professional administration

The results showed that:

1. The present invention of ‘smokeless’ moxibustion device helps to conserve moxibustion material markedly. There is a saving of up to 9 times of moxibustion material as compared to traditional moxibustion using moxa stick.
2. The present invention can control moxibustion temperature, which significantly increases the occurrence of moxibustion distribution effect, thereby increasing moxibustion efficacy.
3. Due to the unique design of the present invention of a ‘smokeless’ moxibustion device, it ensures that there is nearly no thick smoke emitted throughout the moxibustion process, which decreases environment pollution and increases patients’ and doctors’ acceptance towards traditional moxibustion therapy.

Embodiment 6

FIGS. 6, 7, 8 and 9 illustrate the embodiments of the individual components of the moxibustion device:

FIG. 6 shows the assembly of the components of the moxibustion device, including the moxibustion cap, moxibustion cylinder, moxa roll, moxa roll holder, temperature regulator, moxibustion seater and ignition component.

The temperature regulator 1 is engaged with the cap nut 2 via screw threads. The moxa roll holder 5 is connected using two strands of metal wire and resistance wire (molybdenum wire) in the shape of a ‘z’. The two strands of metal wire extend to the base of the moxibustion cylinder and connects with the two ends of the resistance wire (molybdenum wire), forming a closed loop. The two strands of metal wire extend up towards the top of the adjustable bolt 1 and form the electrodes. The shape of the resistance wire (molybdenum wire) is zig-zag, which can support the moxa roll holder with the two metal wires. When power supply is connected at the top, the resistance wire can ignite the moxa roll. To ensure that the moxa roll is secured, the two ends of the metal wire can be bent to form two hooks to fix the moxa roll at its position. The position of the moxa roll 4 in the moxibustion cylinder 3 can be varied by turning the adjusting screws 1, which is equivalent to adjusting the position of the burning moxa roll from the moxibustion seater, thus enabling the temperature at the base of the moxibustion seater to be regulated.

The moxibustion cylinder 3 is made up of an inner cylinder 3-1, inner restricting ring 3-2, outer restricting ring 3-3 and outer cylinder 3-4. The inner cylinder 3-1 is affixed to the inner restricting ring 3-2. The top of the inner layer of the moxibustion cylinder 3-1 is affixed to the moxibustion cap 2. The outer restricting ring 3-3 is affixed to the outer cylinder 3-4. The base of the outer cylinder 3-4 is affixed to the moxibustion seater 10.

FIG. 7 illustrates the construction drawing of the inner cylinder 3-1, inner restricting ring 3-2 and outer restricting ring 3-3 in the moxibustion cylinder 3. The top of the inner restricting ring 3-2 has ridges 29 that are inserted and attached to the bottom of the inner cylinder. The ridges insert into the grooves 28 at the bottom of the outer restricting ring 3-3.

FIG. 8 illustrates the construction drawing of the outer restricting ring 3-3 and outer cylinder 3-4. The outer restricting ring 3-3 is inserted and affixed at the top of the inner wall of the outer cylinder 3-4. The grooves 28 at the bottom of the outer restricting ring 3-4 engage with the ridges 29 at the top of the inner restricting ring 3-2. The moxibustion cap 2 is affixed to the top of the inner cylinder 3-1. There are similar-sized air openings on the inner 3-1 and outer 3-4 cylinders. When the groove at the bottom of the outer restricting ring 3-3 engages with the ridge at the top of the inner restricting ring 3-2, turning the moxibustion cap 2 in one direction will result in the simultaneous turning of the inner cylinder 3-1 as both components are adhered to each other. This results in opposite movements of the inner and outer layer, which causes the air openings on both inner cylinder 3-1 and outer 3-4 cylinder to be covered. This facilitates the adjustment of air outflow, which enables the burning rate of the moxa roll 4 to be controlled.

As the width of the groove 28 at the bottom of the outer restricting ring 3-3 is limited, the extent of rotation of the bolt to adjust the air outflow is only possible within this width limit. The moxibustion seater 10 is affixed to the outer layer 3-4 using adhesive that is heat-durable and environmental friendly. At the same time, the unique relative engagement design of the inner restricting ring 3-2 and outer restricting ring 3-3 allows the outer and inner layers to rotate and adjust the air outflow as one body, which prevents the moxibustion cylinder from being disassembled. The double-sided adhesive that is non-irritating and environmental friendly at the bottom of the moxibustion seater 10 enables the whole moxibustion device to be secured on the acupoints. As the moxibustion cylinder is made of two layers, when smoke-absorption material is pasted on the inner walls, such as with a thin layer of organic charcoal, it has the effects of absorbing smoke and oil. There is a layer of smoke-filtering membrane 17 across the air opening. The ratio of the total surface area of the air inlet to that of the air outlet openings can be adjusted between the range of 0.5-2.

Claims

1. A moxibustion device, comprising a moxibustion cylinder with a moxibustion cap at the top, moxa roll, moxa roll holder and a temperature regulator, wherein the moxa roll is placed on its holder, which is connected below the temperature regulator in the moxibustion cylinder, the temperature regulator protrudes above the moxibustion cylinder from the centre of the moxibustion cap, wherein by adjusting the length of the regulator that protrudes from the top, the distance of the holder from the base of the cylinder is adjusted, wherein there is an air inlet at the bottom of the cylindrical wall and an air outlet at the top, the ratio of the total surface area of the air inlet to the surface area of the moxibustion cylinder is 1-10:100.
2. The moxibustion device according to claim 1, further comprising a temperature regulator that made up of an adjustable bolt and a cap nut, engaged using screw threads, wherein the moxa roll holder is connected to the adjustable bolt using connecting pins.
3. The moxibustion device according to claim 1, further comprising a temperature regulator that made up of a position-limiting spring, position-limiting pellet, position-limiting rod and a sealing ring, wherein the position-limiting rod has 2-5 fixed positions.
4. The moxibustion device according to claims 1, 2 and 3, wherein there is a hollow spherical space at the bottom of the moxibustion seater, the ratio of the total surface area of the air inlet to that of the air outlet openings is 0.5-2.
5. The moxibustion device according to claim 4, wherein an indirect moxibustion film that can be used at the moxibustion seater, the film has a membrane impregnated with extracts from medicinal herbs, the thickness of each membrane is around 1-2mm.
6. The moxibustion device according to claims 1, 2 and 3, further comprising an ignition component located at the bottom of the moxa roll holder, wherein the ignition component is made up of electrodes, non-flammable wire and an electric spark appliance, the electrodes protrude from the side of the cylindrical wall, wherein when the power supply is turned on, the electric spark will ignite the moxa roll, the ignition component is comprised of electrodes, non-flammable wire and resistance wire, wherein the resistance wire is located at the bottom of the moxa roll holder and the electrodes protrude from the side of the cylindrical wall, or wherein the ignition component is made up of electrodes, non-flammable wire and an electric spark appliance, the electrodes protrude from the side of the cylindrical wall, wherein when the power supply is turned on, the electric spark will ignite the moxa roll.
7. A moxibustion device, comprising a moxibustion cap at the top, moxibustion cylinder, moxa roll, moxa roll holder, a temperature regulator and a moxibustion seater, wherein the temperature regulator is in the shape of a bolt, located in the centre of the moxibustion cap; the moxibustion cap is a screw nut and the two parts are connected using screw threads; the moxa roll holder comprises of two strands of resistance wire that pass through the bolt and extend over the moxibustion seater, forming a closed loop with the two ends of the resistance wire, the two wires become the electrodes at the top of the bolt and are attached to the bolt; the moxa roll is placed between the two wires and comes into contact with the resistance wire; the moxibustion cylinder has an inner and outer layer, the inner layer has an inner restricting ring with ridges at the top, while the outer layer has an outer restricting ring with grooves at the bottom, the inner layer is attached to the inner restricting ring at

the bottom, the outer restricting ring is connected and attached to the upper region at the inside of the outer layer; the grooves at the bottom of the outer restricting ring fit into the ridges at the top of the inner restricting ring; the moxibustion cap is affixed to the inner layer at the top; the outer layer is secured to the moxibustion seater at the bottom; wherein both the inner and outer layers of the moxibustion cylinder have similar sized air outlet and air inlet openings, wherein when one of the ridges of the inner restricting ring is at either end of the grooves of the outer restricting ring, the air outlet and inlet openings are at their widest opening or closed position.

8. The moxibustion device according to claim 7, further comprising air inlets located at the bottom of the cylindrical wall and air outlets located above, the ratio of the total surface area of the air inlet to the surface area of the moxibustion cylinder is 1-10: 100, the ratio of the total surface area of the air inlet to that of the air outlet openings is 0.5-2.

9. The moxibustion device according to claim 7, wherein the resistance wire forming a 'z' or closed loop supporting the weight of the moxa roll.

10. The moxibustion device according to claim 7, wherein the bottom of the moxibustion seater is a double-sided adhesive, a smoke-absorption lining is attached on both the inner and outer layers of the moxibustion cylinder.