

## **SEMI-OPEN MASK**

The invention relates to a semi-open mask, transparent or matte, reusable, which protects against the spread of germs, and especially of viruses, which can be transmitted through saliva drops and nasal secretions, respectively through Flüge drops.

With the outbreak of SARS-CoV-2 virus, the spread of airborne pathogens has become a great concern because of its potential impact.

Surgical masks, also known as face masks, are intended to be worn by health professionals during healthcare procedures. They are designed to prevent infections in patients and treating personnel by catching bacteria shed in liquid droplets and aerosols from the wearer's mouth and nose. They are not designed to protect the wearer from breathing in airborne bacteria or viruses whose particles are smaller. With respect to some infections like influenza they appear as effective as respirators, such as N95 or FFP masks; though the latter provide better protection in laboratory experiments due to their material, shape and tight seal.

During the pandemic, people have to wear masks. Unfortunately, very few wear them correctly, blaming the weight on their breathing, the fact that their glasses are steaming, the fact that their face is not visible, etc., most of the time leaving their nose out. Improper wearing of the mask is equivalent to not wearing it at all. Moreover, although surgical masks are designed for single use only, most of the people use a mask for several days, increasing the likelihood of viral transmission.

Several technical solutions are known for transparent and/or semi-open masks, all theoretically aimed at protecting against the spread of germs.

Patent US2008092909A1 is known which relates to a universal, transparent face mask, comprising a transparent central portion, an outer portion surrounding it and fixed to the transparent central portion, and one or more antimicrobial agents. This technical solution proposes a mask that is difficult to use and expensive to produce.

Also known are patents WO2009104442A1, JP2009011475A and JP2013046647A which refer to a transparent mask whose body is composed of a transparent upper portion made of a transparent material and a lower ventilation filter portion made of a breathable material, such as a fabric. These technical solutions offer masks that are difficult to use, expensive to produce and that must be changed periodically.

Also known are patents CN209359732U, CN204697940U, CN104886823A and CN204697941U, which refer to transparent masks consisting of a transparent diaphragm and a chin support, so that there remains a breathing space in the upper part of the mask. These technical solutions do not protect against the spread of germs, the spread being even amplified by the expiration through the upper part of the mask.

The semi-open mask, according to the invention, eliminates the disadvantages of the known solutions, in that it consists of an upper naso-pyramidal part covering the nasal pyramid and the nose, and the main body, which has the lateral portions in contact with the cheeks and the lower semi-open part, allowing the passage of breathed air. The front face of the mask's body has a convex surface inwards, so that the exhaled air moves exclusively downwards due to the Coanda effect.

The problem solved by the invention consists in making a semi-open, transparent, reusable mask that can be worn both with a classic grip, behind the ears, and attached to glasses or a specially designed frame, without hiding the wearer's face. Moreover, the semi-open mask can be used comfortably enough in cafes, restaurants, and even for swimming. The mask provides complete protection against the spread of germs by projecting the expired air downwards, to the ground.

The invention has the following advantages:

- Due to the free, semi-open lower part, the mask ensures easy breathing, without creating respiratory discomfort;
- Due to the Coanda effect produced by the convex shape on the inside of the anterior face, the mask prevents the remote transmission of saliva drops and nasal secretions of the wearer (Flügge drops), directing them downwards;
- All versions of the mask are specially created so as not to cause the glasses to mist;
- The mask is light and comfortable to wear;
- It can be easily taken down, together with the glasses or the support frame;
- The mask can be reused and can be cleaned by washing with soap and water;
- The mask can be produced in a transparent, pigmented or matte version;
- The transparent version of the mask eliminates the psychological and social effects of classic masks;
- Depending on the model, the mask can be worn with a classic grip, behind the ears, attached to the glasses or to a specially designed frame, or independently, with or without glasses;
- It can be made of a single piece of plastic or medical silicone, or combining the upper part made of silicone and the body of the mask made of plastic;
- It is cheap and easy to make in any of the possible application variants;

The following is an embodiment of the invention, in connection with figs. 1 ... 6, which represent:

- Fig. 1, side view of the semi-open mask;
- Fig. 2, side view of the half-open mask attached to the spectacle frame;
- Fig. 3, front view of the semi-open mask attached to the spectacle frame;
- Fig. 4, sagittal section of the semi-open mask;
- Fig. 5, cross section of the semi-open mask at the level of the nasal pyramid;
- Fig. 6, cross section of the semi-open mask at the level of the jaw.

The semi-open mask, according to the embodiment, consists of an upper naso-pyramidal part (1) that covers the nasal pyramid and the nose, and the mask's body (2), which has the semi-open lower part (3), allowing the free passage of breathed air (4). The anterior face of the mask's body (2) has a discreetly convex surface inwards (5), so that the exhaled air moves exclusively downwards due to the Coanda effect. In order to seal the upper region of the mask, the upper naso-pyramidal part (1) and the mask's

body (2) are provided with a molded edge to contact the face of the mask's wearer (6). For a better fit at the level of the nasal pyramid, the naso-pyramidal part (1) can be provided with an adjustable, metallic element (7). The semi-open mask is attached to the spectacle frame (8), or to a support frame, by means of a strap (9) provided with a fastening system (10), of velcro, staple or buckle type, so that, in order to secure the assembly, the nose pads (11) must be anterior to the fasteners (12).

Next, another embodiment of the invention is given, in connection with figs. 7 and 8, which represent:

- Fig. 7, side view of the semi-open mask fixed with elastic behind the ears;
- Fig. 8, front view of the half-open mask fixed with elastic behind the ears.

The semi-open mask, according to the embodiment, consists of an upper naso-pyramidal part (1) that covers the nasal pyramid and the nose, and the mask's body (2), which has the semi-open lower part (3), allowing the free passage of breathed air (4). The anterior face of the mask's body (2) has a discreetly convex surface inwards (5), so that the exhaled air moves exclusively downwards due to the Coanda effect. In order to seal the upper region of the mask, the upper naso-pyramidal part (1) and the mask's body (2) are provided with a molded edge to contact the face of the mask's wearer (6). For a better fit at the level of the nasal pyramid, the naso-pyramidal part (1) can be provided with an adjustable, metallic element (7). The semi-open mask is positioned on the face and fixed to the ears with the help of elastic bands (13).

Next, another embodiment of the invention is given, in connection with figs. 9 and 10, which represent:

- Fig. 9, side view of the semi-open mask with fixation on the nose;
- Fig. 10, cross section of the semi-open mask with fixation on the nose at the level of the nasal pyramid.

The semi-open mask, according to the embodiment, consists of an upper naso-pyramidal part (1) that covers the nasal pyramid and the nose, and the mask's body (2), which has the semi-open lower part (3), allowing the free passage of breathed air (4). The anterior face of the mask's body (2) has a discreetly convex surface inwards (5), so that the exhaled air moves exclusively downwards due to the Coanda effect. In order to seal the upper region of the mask, the upper naso-pyramidal part (1) and the mask's body (2) are provided with a molded edge to contact the face of the mask's wearer (6). The semi-open mask is positioned on the face and fixed to the nose with the help of striations (14), which can be replaced with an adhesive that must be changed periodically. The semi-open mask can be further stabilized by wearing glasses (8), so that the nose pads (11) are in front of the fasteners (12).