Supporting Information for **“Fabrication of Soft and Wearable Electrostatic Generator Based on Streaming Electrification”**

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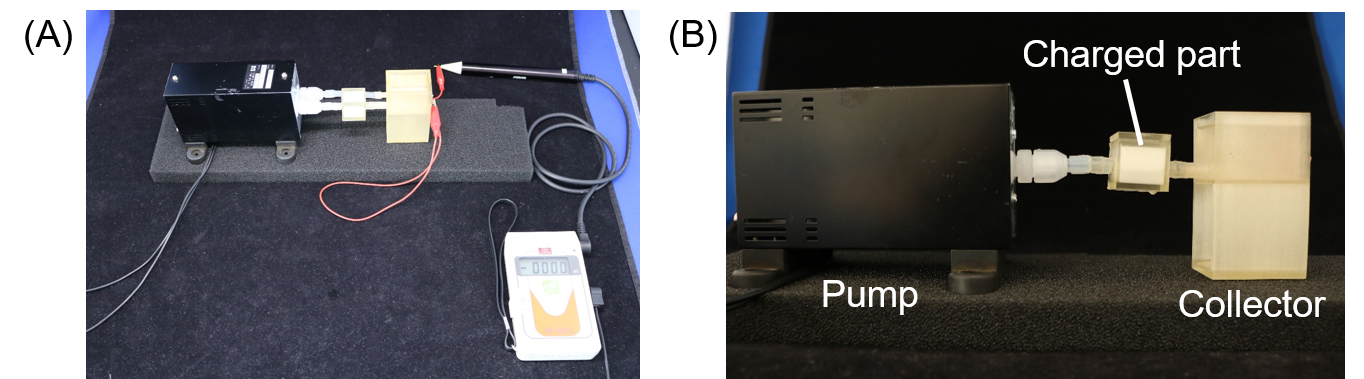
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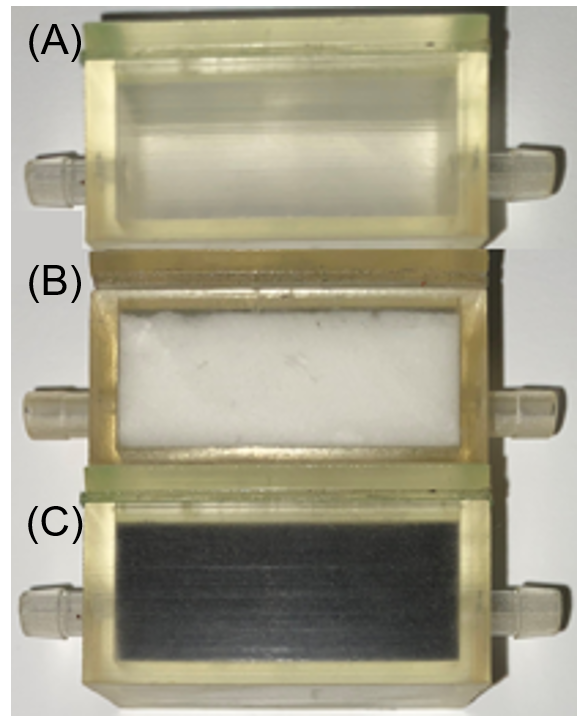
# Figure S1

Experimental system: (A) overall view and (B) generator part.



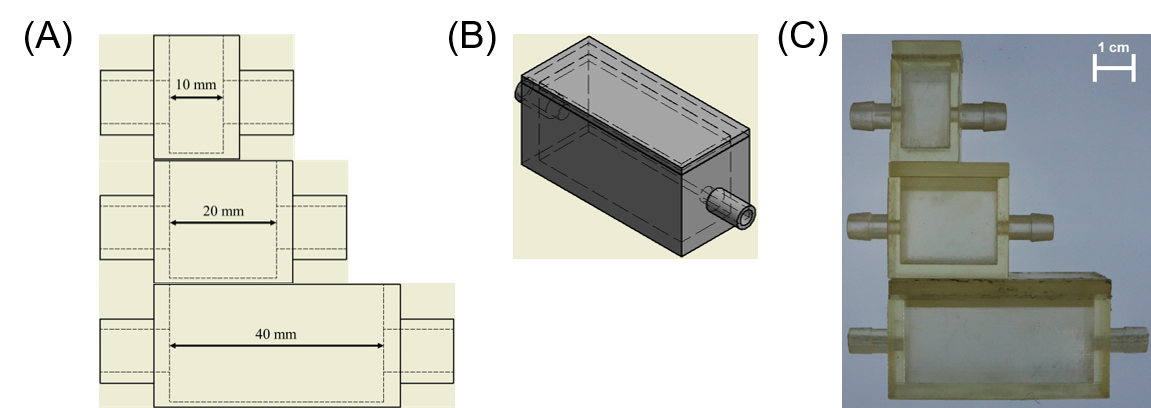
# Figure S2

Photograph of charged part: (A) empty, (B) filled with melamine sponge, and (C) filled with urethane sponge.



# Figure S3

  Design of sponge case: (A) lengths of 1, 2,  and 4 cm, (B) 3D CAD model, and (C) 3D-printed parts.



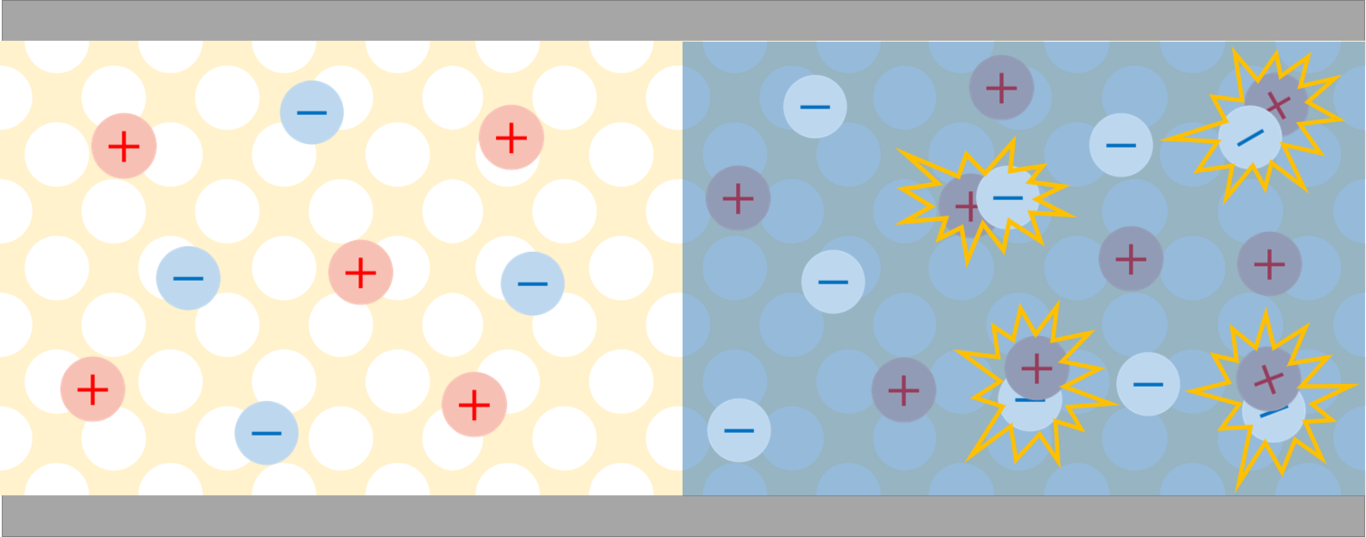
# Table S1

Measurement conditions .

|  |
| --- |
| December 3, 2020, Shibaura Institute of Technology Laboratory, temperature: 2 F (21 ℃), RH: 40% |

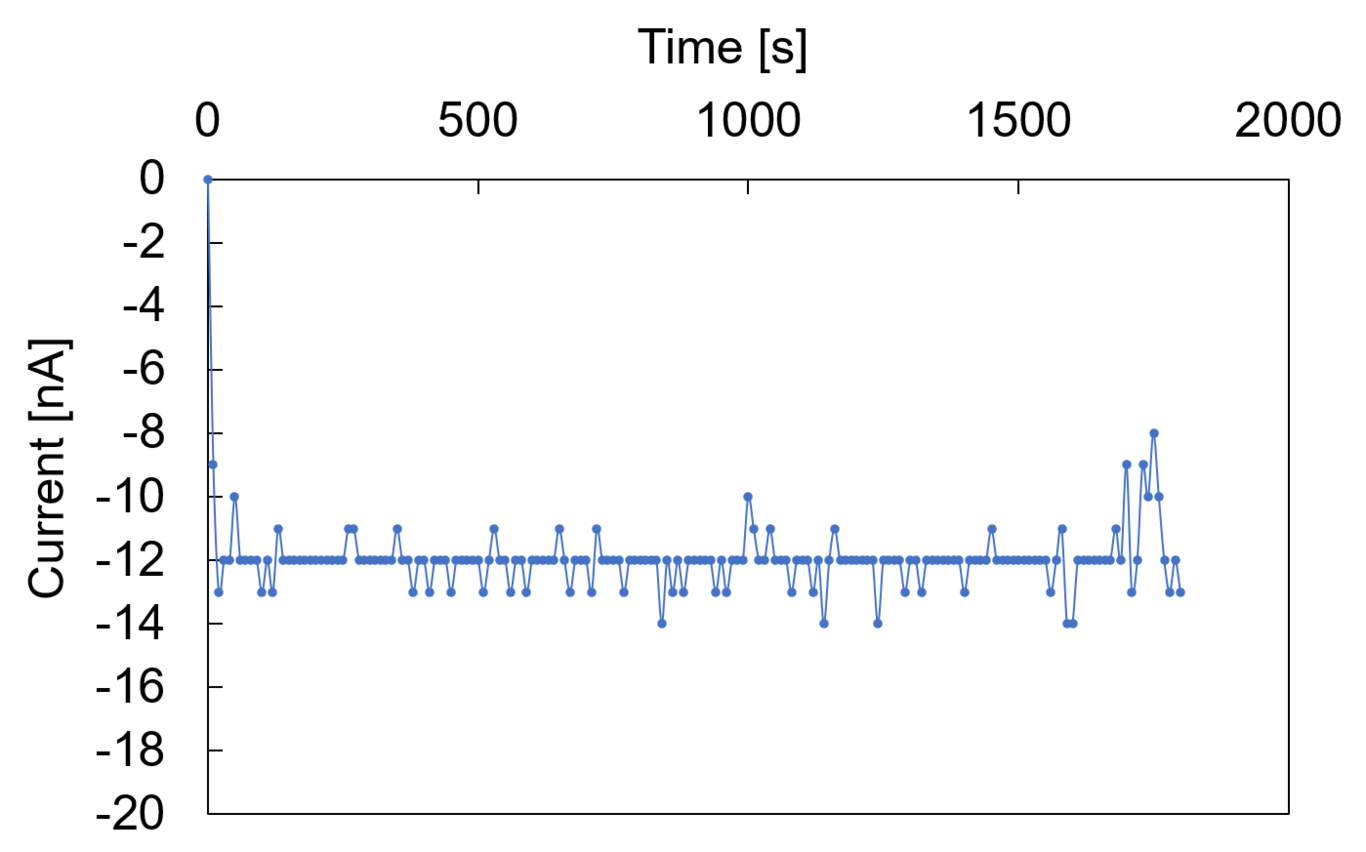
# Figure S4

Relaxation of electric charge. When Novec 7300 flows into a melamine sponge, the melamine sponge becomes positively charged and Novec 7300 becomes negatively charged. When Novec 7300 flows into the positively charged melamine sponge, the opposite sign charges recombine with each other and the amount of charge decreases. We guess that relaxation of charge due to recombination to be the reason for the decrease in charge generation when the contact time is long.



# Figure S5

Durability experiment on the SEG. The SEG was directly connected to the digital multimeter to measure current and driven for 1800 seconds. The output current did not change much before the liquid volatilized.



# Equation S1

From Gauss’s law,  we get

From Coulomb’s law,  we get

From the model in Figure 3F, we get

where the force experienced by the charge at position A from that at position B is

In addition, it is essential to note that the moment resulting from FAB around Ois

By setting the total moment around O=0, we get

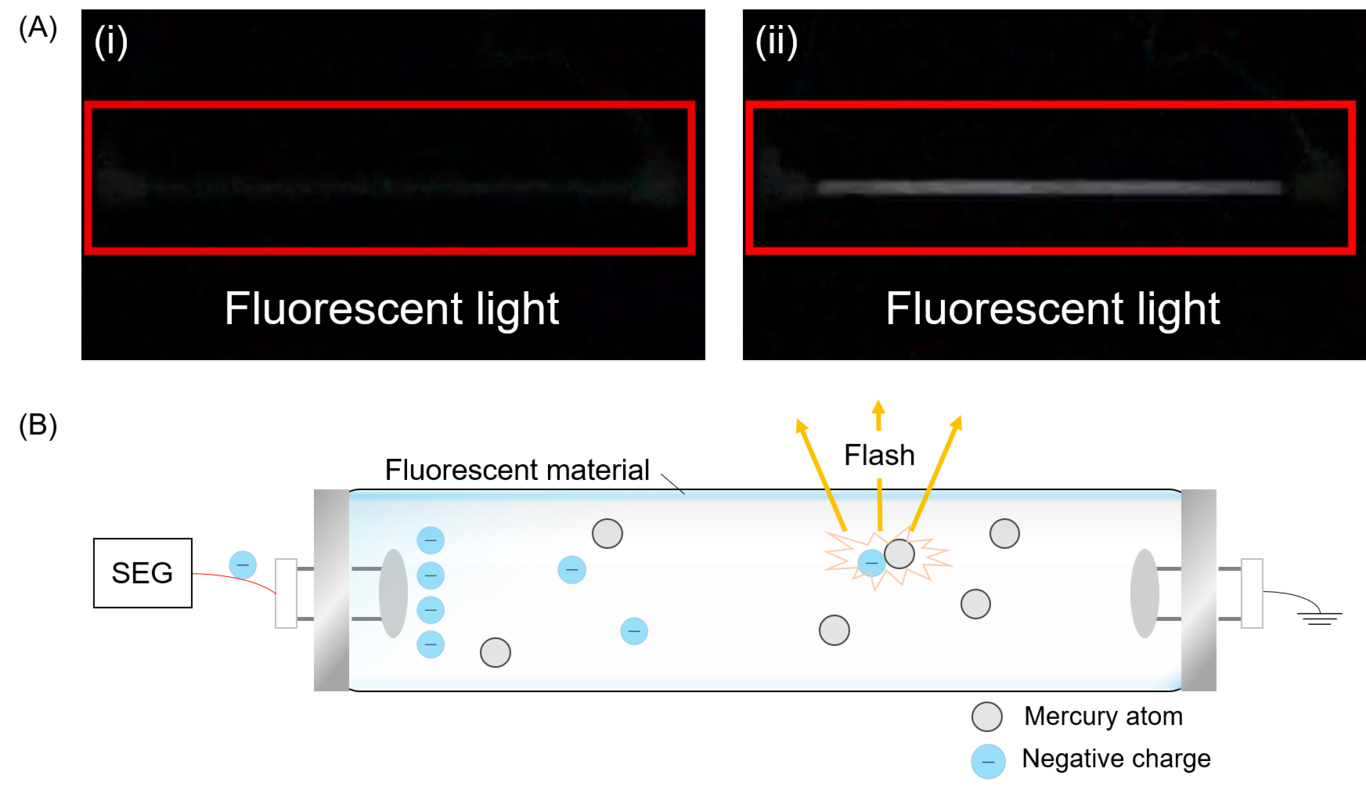
On substituting this in Equation 4, we get , we get

Therefore, the relationship between the angle of the electroscope leaves and the charge density is as follows:

where, ε is the permittivity of air, g is the acceleration due to gravity, m is the leaf mass, h is the leaf length, and O is the leaf junction point.

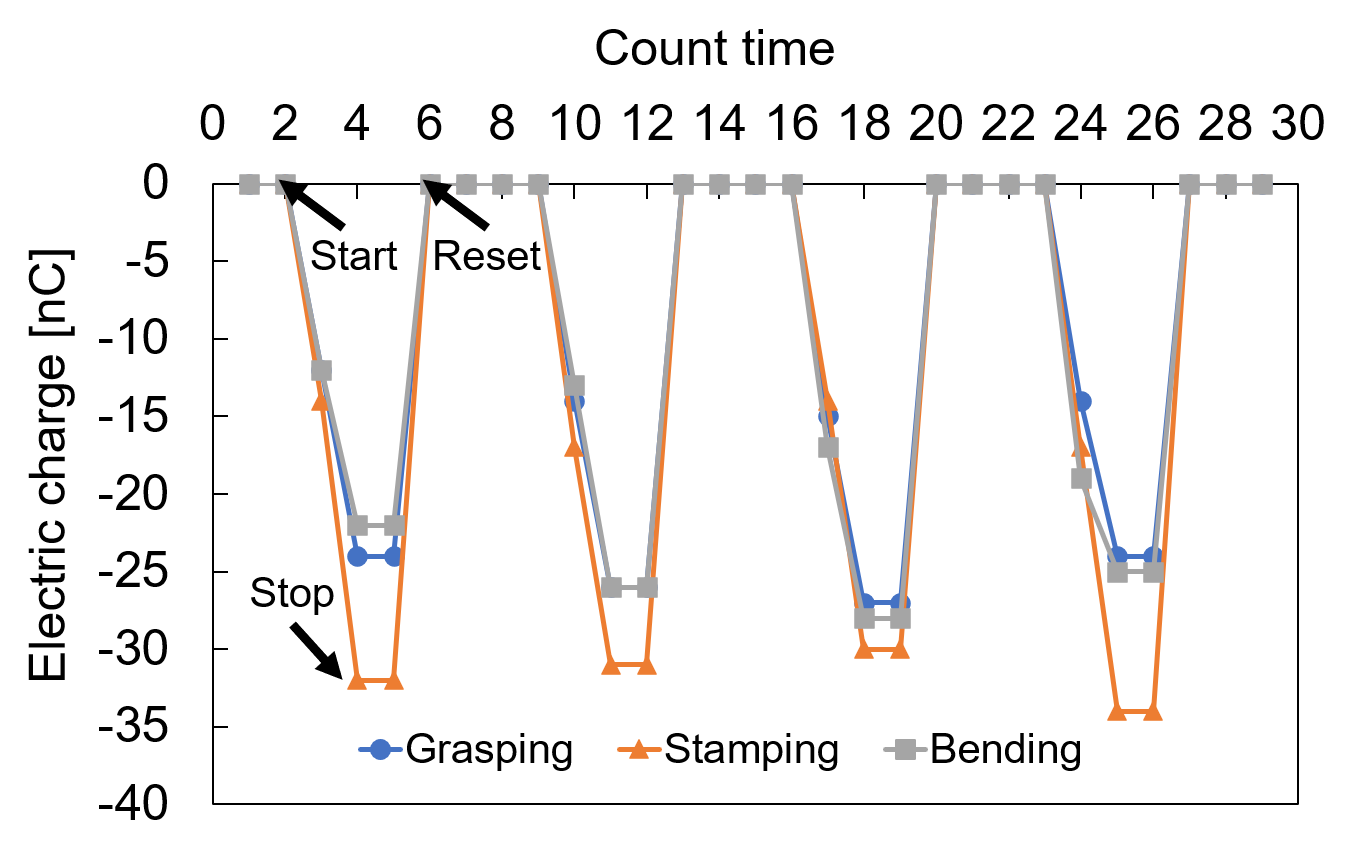
# Figure S6

(A) Photograph of fluorescent lamp lit using SEG: (i) before being driven by SEG and (ii) after being driven by SEG. (B) Inside the fluorescent lamp: Electrons supplied by SEG are emitted from the electrodes of the lamp. The mercury vapor reflects the electrons that produce ultraviolet light, which is emitted by the luminescent material coated on the inner surface of the glass.



# Figure S7

Amount of charge collected for each device (grasping, stamping, bending) fabricated using the SEG. “Start” is the point of the device activated. “Stop” is the point of the device deactivated. “Reset” is the point of the measurement system to be reset.



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# Supplementary Videos

## Video S1

Rich media available at <https://youtu.be/PS0l2riEGa0>

## Video S2

Rich media available at <https://youtu.be/4eBQimxA1SU>

## Video S3

Rich media available at <https://youtu.be/IbblsYSjFpY>

## Video S4

Rich media available at <https://youtu.be/AG_vg6SeDUg>

## Video S5

Rich media available at <https://youtu.be/sH1aWT8QWR8>

## Video S6

Rich media available at <https://youtu.be/WX-fSDsUCJw>