I converted from Japanese to English using google translate. The meaning is not perfect. Please read while understanding.

200-300% faster reed vibration
An item that causes "the world's fastest vibrating reeds" is born!

Movies 1 2 3 4 5 6 7 8 9 10

I want to make the instrument sound more.

I want to make a sound easily.

I would be happy if I could change the sound quality to my liking.

I want to make a dark sound.

I want the instrument to react as I want.

I want the reed I'm using to vibrate well.

I want to make a sound with more presence.

I want to produce sounds that can be produced by a good instrument with my own instrument.

I want to practice in my house, at a low volume and with ease.

How do I do this?

Just put this ligature on your instrument.
these problems will be solved.

Doping" the sound with a bang

Mysterious ligature was developed.

For clarinet and saxophone lovers
No one in the world has ever experienced
Provides a nice experience

The overtones contained in the blowing sound are greatly increased,

dramatically increasing the potential of the instrument.
The sound became powerful, awesome, and had a strong presence, and the appeal to the listener became stronger.

You can easily change the sound quality while playing.

The reed frequency is greatly increased, the volume is increased, and the sound of the instrument is better removed.

By greatly expanding the dynamic range between PP and f f compared to the past, You will be able to control the intonation and delicate nuances of the song as you wish.

The flimsy sound is thick and delicate, as you wish. Feel the possibility of new sounds.

I feel like I'm getting better with more fraud and sub-tone .

The sound became more lustrous and colorful, and the density of the sound was clearly finer.

Since the sound is produced easily, the repertoire of difficult phrase songs increases.

When you suppress vibration, you increase vibration? What do you mean?

You'll get the answer later.

The concept of conventional acoustic improvement methods is
It was designed to increase the volume by transmitting the resonant vibrations of the mouthpiece directly to the body of the instrument.

As a concept of this ligature
By absorbing the resonant vibration of the mouthpiece and suppressing its decay, the reed vibration frequency is increased.
Overtones that did not appear at all when the normal ligature was used will newly appear.
By adding these overtones to the original amplitude waveform sound, the total amount of amplitude waveform sound increases two to three times.
The increased sound vibration is a factor that increases the volume of the instrument. (Patented)

3D images such as game characters can be displayed on a computer equipped with graphics.
The average number of rewrites per second is 60Hz, so that 120Hz to 240Hz is achieved.
The blowing sound is 2-3 times deeper and richer than when using a normal ligature.

The sound that was played was made visible.
It is the voice scope function of the next spectrum analyzer.

We verified the change in the amount of amplitude waveform output from the lead under three types of blowing conditions.
Amplitude waveform: A sound waveform that is the shape of a vibrating wave that extends from the top of the peak to the bottom of the valley of the waveform.
With this audio scope, the upper and lower folded parts where the waves are connected from the top of the mountain to the bottom of the valley
It is abbreviated and represented by one vertical line.

Instrument is curved soprano saxophone, normal ligature The lead is made of Legere resin (hardness 1. 5), and the mouthpiece isMayer 6M. The scale does not press any key One octave above the instrument, ½ feet wide from the bell.
Amplitude of the sound produced The waveform period

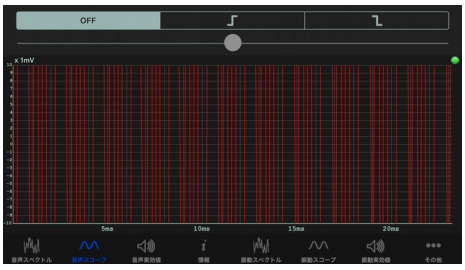


Image 1

was measured 5 times and averaged.

As a result, as shown in image 1, the amplitude waveform indicated by the sound emitted from the mouthpiece is 60 times in 0. 02 seconds. ..
The amplitude waveform oscillated 3000 times in 1 second.

Next, in the photo on the right, attach the device of the present invention indicated by the red arrow to the mouthpiece.
Verify the difference in amplitude waveform due to vibration damping.
Material: Iron, Dimensions: Width 15mm, Length 60mm,
It has a thickness of 5 mm and a weight of 37 g,
so it has a thickness of 5 mm. Use the ligature for alto saxophone to pinch

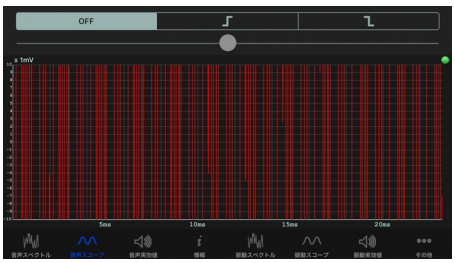
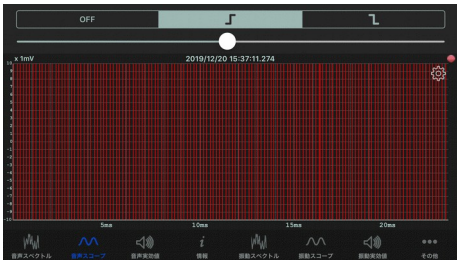


Image2

As shown in image 2, I attached an iron tool with a red arrow.
The sound from the lead is also 90 times in 0,02 seconds,
The amplitude waveform oscillated 4500 times in 1 second.

Finally, a damping alloy is used for the material of the equipment.
Thickness 1 mm, length 85 mm, width about 13 mm,
Weight 10g A magnet of 24g is used as a weight.

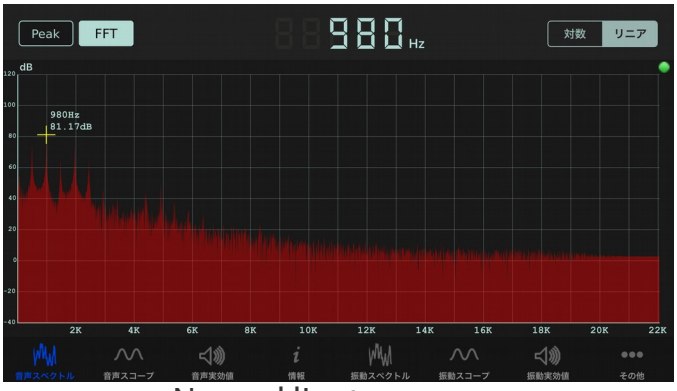


The sound measured as shown in image 3 takes 0,02 seconds.
It vibrated 119 times, 5950 times in 1 second, with an amplitude waveform about twice that of the normal ligature.

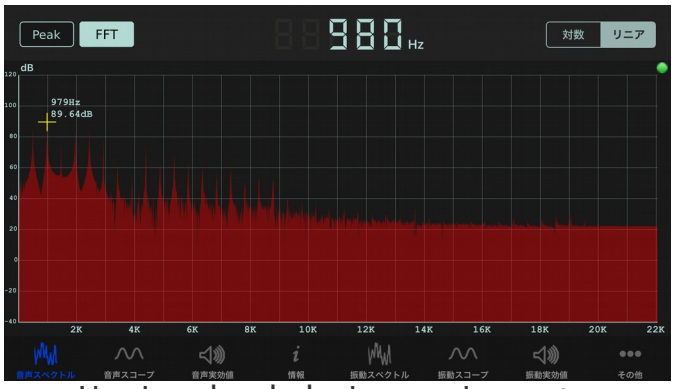
Image3

By the way, as a comparison, when measuring with the conventional LefreQue sound improvement item,
Like a normal musical instrument, it vibrated with an amplitude waveform of 3000 times per second.

Also, as shown in the two images below, in the audio spectrum,
The frequency distribution of normal and iron appliances was measured in a visible manner.



Normal ligature



Use iron book design equipment

The peak frequency of the audio spectrum of the normal musical instrument in the left image isFor 81 and 17db at 980HZ
The peak frequency of a musical instrument equipped with an iron instrument in the image on the right isAt 980HZ, it is 89, 64db, and the difference from normal is 8. 5db, and the volume is about 2. 5 times higher.
Many peak protrusions appear even in the frequency characteristics.
You can see that it contributes to acoustic improvement such as improvement of volume and overtones.

Finding the fundamental commonality of this question from other experiences in the past, The following two led to the idea that this frequency would increase.

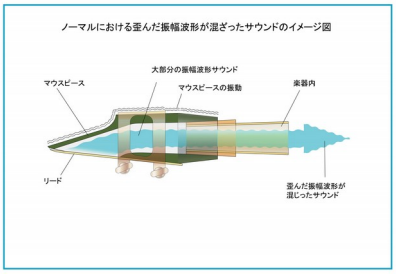
1 For example, when playing music with a bare speaker hung with a string
The vibration from the vibration paper (reed of the musical instrument) of the vibration source
At the same timing, it is transmitted to the frame of the speaker (the thin of the musical instrument)
The frame vibrates violently.

At this time

As a result of the vibration generated from the vibrating paper and the resonance vibration of the speaker frame interfering in the speaker, the amplitude waveform

generated from the vibrating paper is distorted, and the original speaker playback sound quality deteriorates.
For this reason, the speaker is firmly fixed to the thick plate housing so that the sound quality does not deteriorate.
It is necessary not to vibrate the speaker body.

In the saxophone

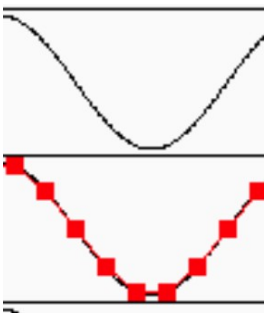


The mouthpiece is connected to the neck via a cork. In this state, the cork on the neck catches the vibration of the mouthpiece, and the vibration remains in the mouthpiece.
Just as shown in the figure on the right, the amplitude of both the reed vibration and mouthpiece resonance vibration waveform sound interferes with the reed is trying to vibrate normally is interfered with the mouthpiece. It is inevitable that some distorted sound will pass through the instrument.

This speaker vibration paper interferes with the frame vibration, and the amplitude waveform sound of the distorted reproduced sound and Saxophone reed vibration and mouthpiece resonance vibration Amplitude waveform sounds played in a distorted state due to interference are similar in this respect.

2 From another point of view

reed vibration

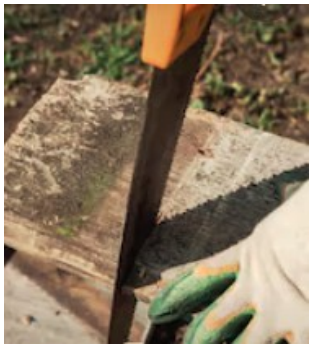


The frequencies of reeds vibration and mouthpiece resonance vibration are as shown in the figure on the right.
If you divide it into the smallest units in detail, both frequencies are
It is shaking with the same waveform and the same timing

Mouthpiece vibration

If you compare this

..



When cutting a thin plywood with a saw,
Place half of the board on the base and lightly add your hands
The other half is floating out of the table
Suppose you want to cut it.

Then

When the saw is pushed or pulled up and down, the board moves up and down in synchronization with it, so that the saw blade is jagged.
Some that should be cut is not actually cut.
This is because the board vibrates according to the top and bottom of the saw.
Some of the saw's cutting power has been lost.

So

In order to cut the board efficiently
If you press the board strongly so that it does not vibrate up and down, you can cut forward quickly!
Everyone knows this from experience and wants to cut it easily, so I do this unconsciously.
With this, the power of the saw that cuts the board can be fully demonstrated.

Also, considering the relationship between kitchen knives and whetstones,
The side that produces the force is the kitchen knife, and the side that receives the force is the grindstone.

When sharpening a knife, the length that the knife moved on the grindstone is 4 inc, whereasSuppose the grindstone moves in the same direction as a 2 inc.
At this time, the knife actually sharpens the cutting edge only 2 inc,
If the side that exerts force and the side that receives force move at the same time, the efficiency of sharpening will be reduced by 50%.
If you fix the grindstone so that it does not move, the efficiency of sharpening the knife will be 100%.

When the side that emits this vibration and the side that receives the vibration are vibrating together,
The principle is that if the vibration on the side that receives the vibration is suppressed, the vibration (force) on the side that emits the vibration will increase.

Now, back to the saxophone.

If the resonance vibration of the mouthpiece transmitted at the same timing as the lead vibration is suppressed,

Since the lead vibration efficiency easily increases, the amplitude frequency (sound wave) including the overtones passing through the instrument increases, resulting in deeper sound quality and higher volume.

In other words

If you play with a normal ligature and the mass piece resonates and vibrates, that means you're playing with the best ligature in the world.
Even if it's the ligature that gave me the best blowing feel in the world until now.
The saw was cutting a thin board, and the board was blowing in a violent and inefficient way of cutting.
This sound was also the sound of the reed instruments we've always been familiar with, but It was not an environment in which the reeds vibrated at 100 percent efficiency.
Again, because of the resonant vibration of the mouthpiece
No matter how much we devised the shape and material of the saw blade, it was as if we were cutting the board without holding it down.
As far as reed vibration was concerned, it was not 100 percent efficient.

Based on these, if you attach the ligature of the present invention

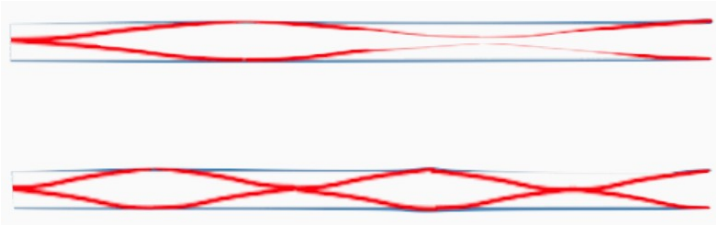
Reed vibration efficiency is improved by suppressing the resonance vibration of the mouthpiece.
Some amplitude waveform sounds (overtones, etc.) that did not appear when using a normal mouthpiece
The total amount (volume) of the amplitude waveform sound increases as the amplitude waveform sound is added to the blowing sound.
As a result, it becomes easier to control the blowing sound, and a stable sound can be obtained. this
As the increased amplitude waveform sound passes through the instrument, the vibration of the entire instrument increases more than ever.

At the same time, by suppressing the vibration of the mouthpiece, the amplitude waveform of the reed and the mouthpiece
The degree of interference with the amplitude waveform is reduced, and the sound emitted from the instrument becomes a beautiful amplitude waveform.

__However, even if the vibration is suppressed, the vibration of the mouthpiece itself does not become zero when playing.
This remaining vibration is the vibration of the remaining unnecessary amplitude waveform that suppresses the required amplitude waveform.
Just when cutting a board with a saw, hold the board so that it does not move, and even if the cutting efficiency of the saw is 100%, the vibration from the saw to the board does not disappear when cutting.

The image below shows the amplitude frequency passing through the instrument.

As shown in the figure below, the sound played by attaching the ligature of the present invention to the mouthpiece is as shown in the figure below.
Overtone amplitude frequency passing through the instrument compared to the sound with the same scale as the normal ligature
The number of waves (red line) increases, making it easier to produce sound and making the sound stable and loud.



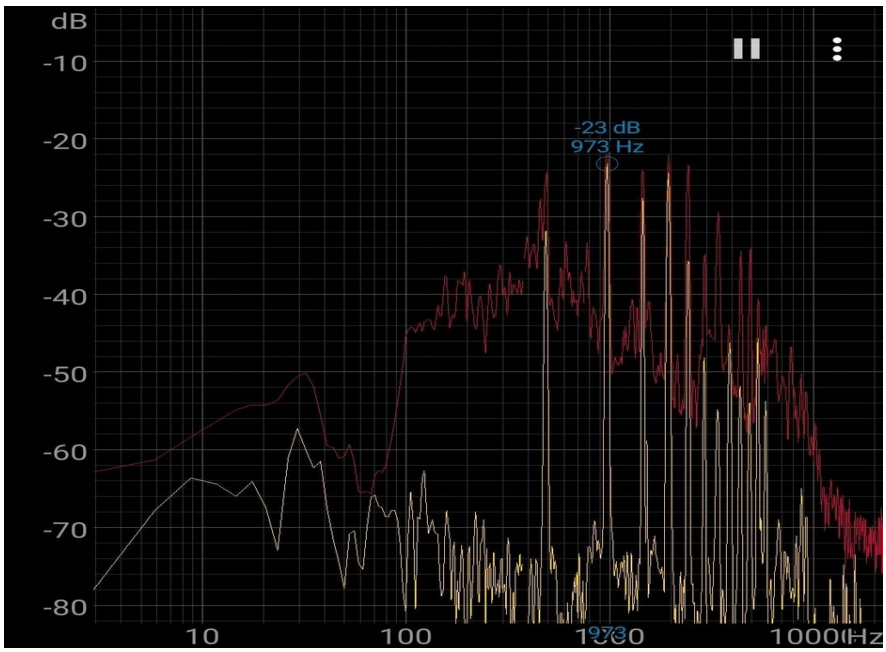
Above figure
Amplitude frequency of normal ligature sound
Lower figure
Amplitude frequency of the ligature sound of the present invention

So there.

Using a soprano saxophone, we compared and measured the frequency distribution of the normal ligature and the new ligature, which produced a C# sound one octave higher with no key pressed anywhere.

Left, Normal ligature

Right, 0.2in thick barrel type ligature
Weight 0.6oz



Red line, 0.2in thick barrel type ligature

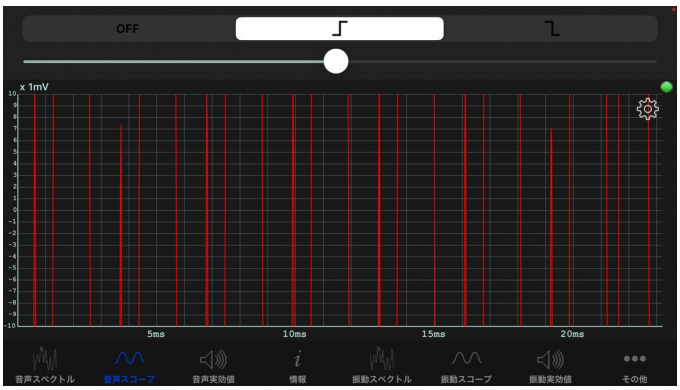
White line, normal ligature

You can clearly see that the 0.2 in thick barrel-type ligature generates a relatively high decibel frequency compared to the normal ligature.

Therefore

Played with normal ligature and experimental ligature using alto saxophone
Verify changes in amplitude waveform amount and frequency distribution.

Ligature is Selmer The scale is a C# one octave higher without pressing any keys.
The amplitude waveform period of the sound emitted from the musical instrument was measured 5 times at a position 12inch beside the bell and averaged.

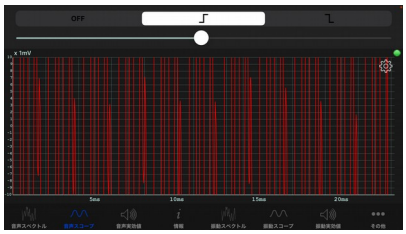
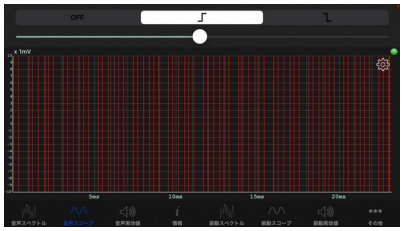
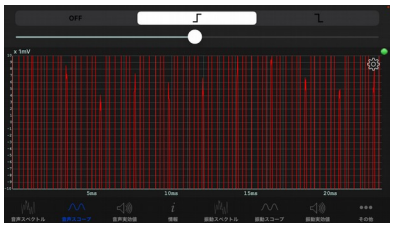
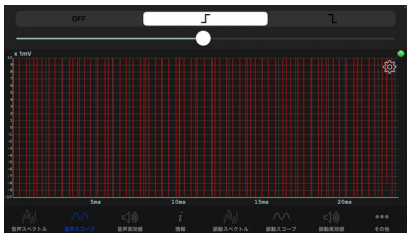
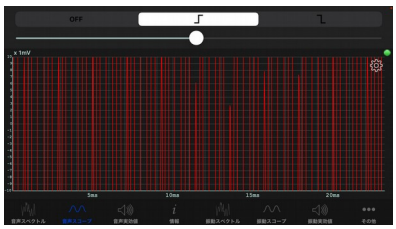


In the upper left normal ligature, as shown in the upper right image,
The reed was vibrating at an amplitude frequency of 1000 times per second.

and
Processed woodstone tenor ligature and added anti-vibration alloy
The scale is a C# one octave higher without pressing any keys.
The amplitude waveform period of the sound emitted from the musical instrument was measured 5 times at a position 30 cm beside the bell and averaged.

When I played this,
In the 5-time average of the amplitude waveform sound below, the lead vibrated 3250 times per second.

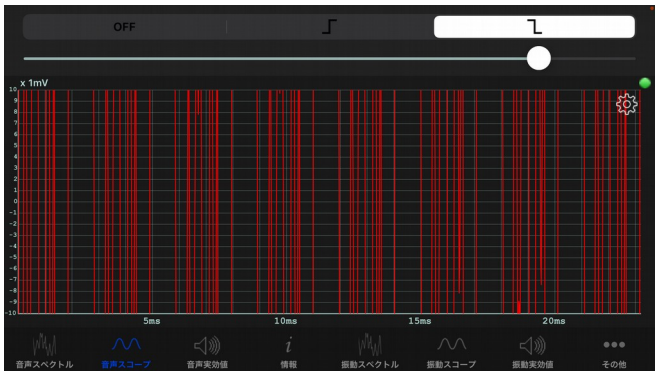
Voice scope measurement result

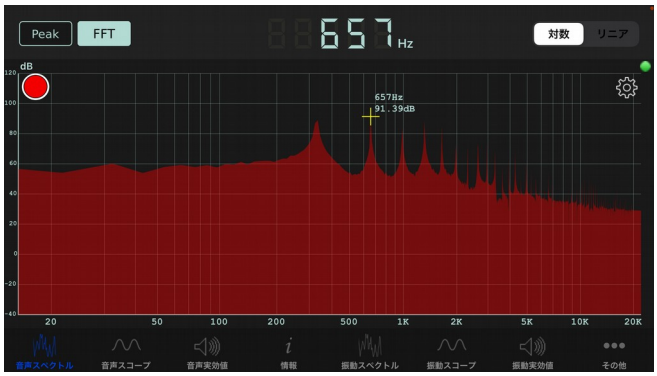






This blowing sound is compared with the waveform sound that is 1000 times per second when using a normal ligature.
Because it becomes a corrugated sound that is more than three times as dense and passes through the instrument,
Compared to the sounds that have been produced in the past, the ease of blowing the sound, the thickness, the delicacy, the freedom, etc.
You can make sounds with a different dimension of happy playing feeling that no one has ever experienced.

To explain this feeling in words,
The sound of three people playing at the same time is aggregated, and the sound is as if it were produced by a single instrument.

It is appropriate to express as.
There is a wave of sound that is more than
three times as strong as the normal ligature. There are many mid-high overtones





If you want to increase the amplitude waveform period, you can easily measure it by raising the pitch, but
As mentioned above, it is unlikely that the amplitude waveform period will increase when measuring at the same pitch.
However, if you play the same pitch using the ligature of the present invention,
The amplitude waveform period increases to 2 to 3 times that of the conventional ligature in the above measurement.
With this dramatic increase in lead vibration compared to the past, clarinet and saxophonists will witness a number of joyful experiences they have never experienced before!

Currently, we are prototyping four types of ligatures and ligature covers.

C-type ligature cover (Prototype) weight 1,2oz
The four types of ligatures are lighter than aluminum
It is 25% of the weight of steel.
It absorbs 600 times more vibration than steel.
Movies **1** **2** **3** **4**

Disadvantages of using this
Because of the cut, it is slightly less effective than a barrel-typed ligature. It is not as effective as a barrel ligature because it is cut, so it is larger and heavier.
However, 1. 4 oz is enough for an alto saxophone.

Prosof of using this
While playing with a normal ligature, you can insert this ligature cover from the front.
When you are playing with a normal ligature, you can insert this ligature cover from the front and instantly change the volume and ease of playing.

You can use it after stopping the normal ligature at the optimal position where the reed vibrates well.

C-type ligature cover with magnet (prototype) Weight 1,2oz
Adhere copper, brass, aluminum, iron, etc. to the magnet, By changing the metal and size of each and letting them stick to the magnet in the left photo, It can be instantly changed to a tone or a feeling of blowin. Movies 1

Disadvantages of using this
This ligature is a little heavy due to the massive magnet attached to it.

Prosof using this
Compared to C-type ligatures without magnets, the feel and tone are sharper.

Copper, brass, aluminum, iron materials can be glued to another magnet during playing.
By attaching copper, brass, aluminum, iron, or magnesium material glued to another magnet during playing, you can instantly change the volume, ease of playing, and sound quality.

Eccentric-type ligature (prototype) weight 1,2oz
Insert it into the mouthpiece to secure the lead and
Change the thickness that hits the lead by turning this
You can change the tone and the feeling of playing.

Movies 1 2

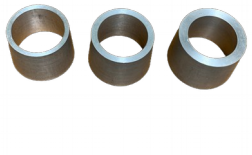
Disadvantages of using this

When replacing the normal ligature with this one, you need a little more time.

Pros of using this

By turning and setting this while holding the reed with your fingers, you can instantly change the volume and ease of playing.

You can instantly change the volume and ease of playing.



barrel-type ligature

By changing the thickness,

You can change the tone and the feeling of playing.

Movies 1 2

Disadvantages of using this

When replacing the normal ligature with this one, you need a little more time.

Pros of using this

Brass, aluminum, copper, or other ring-shaped covers can be attached to the outside of this barrel-type ligature.

Brass, aluminum, or copper ring covers can be attached to the outside of the barrel ligature to change the tone and feel of the instrument.

The mouthpiece vibration is transmitted through the entire barrel-type ligature, which is very efficient.

Even though it is small and lightweight, it is highly effective in changing tone and playing feel.

To summarize these effects

When you attach the device ligature to the mouthpiece, the reed vibration increases two to three times Because the increased amplitude waveform passes through the instrument, the vibration reaches the tip of the bell, increasing the volume.

As an image, it is as if the wind of sound generated by the reed is doubled or tripled and passed through the instrument.

But what about the actual feeling of playing?

Since the frequency of the reed rises and the playing becomes easier, you can concentrate on the sound you make.
You will be able to perform with more powerful, amazing, and presence than ever before.
It's like playing on another well-tuned instrument.

You will be able to produce better sound as if you were doped, and improve your expression and performance skills.

Because you can easily make the first sound using soft tonguing in a ballad song You can control the tone and expressiveness as you like.

The sound of the outdoors reaches far.

The bass sounds without any pain, and the alto bass sounds like a tenor.

The width of Fortissimo from Pianissimo in the dynamic range is wider than normal.

In addition to making a strong "huh" sound, the reed vibrates even if you take a weak breath with a "huh".
The crescendo and decrescendo also react delicately as you wish.

When I blow in the house, I can put a towel inside the bell to reduce the sound. It is easy to practice because the breath is not so painful. However, only the lower notes are not produced.

You can play with a powerful and loud sound.

The instrument sounds so good that practicing becomes an obsession and fun.

As with one of the guitar effectors, the sound comes out before normal.

When I listen to this, everyone says, "It sounds so much cleaner than the normal ligature." And.

For those who think that there is no such good story,
I thought I was deceived and once
Try playing with the ligature of this idea. I realize that all the explanations were true.

Lastly,
The ligature for wind instruments of the present invention
Reed vibration that creates a sound peculiar to musical instruments by attenuating and suppressing the resonance vibration of the mouthpiece,
One thing is that the resonance vibration of the mouthpiece is superimposed in the mouthpiece and there is less turbulence that interferes.
By improving the vibration efficiency of the reed, the number of amplitude waveforms can be increased.
It has the effect of improving the expressiveness and volume of the sound produced by the instrument.
And by attaching a ligature cover on top of this ligature
You can change the sound quality instantly during the performance.

More specifically
The number of overtones contained in the blowing sound has increased significantly, and the sound has become more powerful, awesome, and has a strong presence.
It has the effect of increasing the potential of the instrument and strengthening its appeal to listeners. In particular, the dynamic range between pianissimo and fortissimo is higher than before.
By expanding it significantly, you will be able to control the intonation and expressiveness of the song as you wish.
There is such an effect.
Currently, we are repeating verification experiments to obtain the final shape.

I'm doing everything by myself now
In order for you to get this item, you need a collaborator in various aspects such as financial and human resources.

.

Please look forward to this ligature that will surprisingly improve the sound quality and expressiveness of the sound.

As of 2022/11
We have newly developed a new item that greatly exceeds these above items.
We have succeeded in developing a new product that far surpasses the above items.
I can't write about it here now due to patent issues.
I am sure that all saxophonists will be very pleased.

This is Mr. Suenaga, the developer of this product.

-

Besides this, I made a hole in the reeds to make it easier to blow around 1992-3.
We are devising a reed-up. **Http://www.kit.hi-ho.ne.jp/suenaga/**

REED-UP